

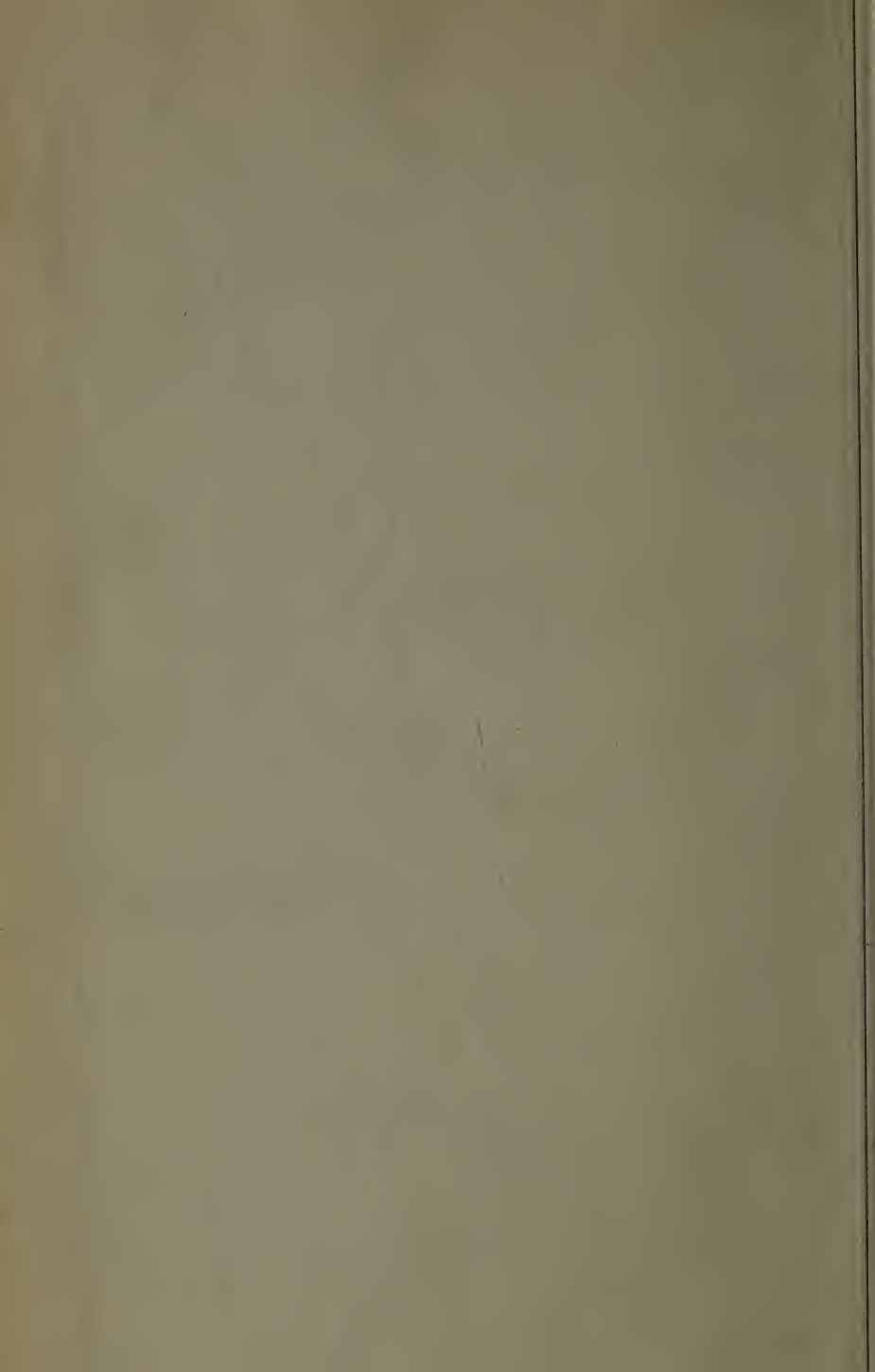
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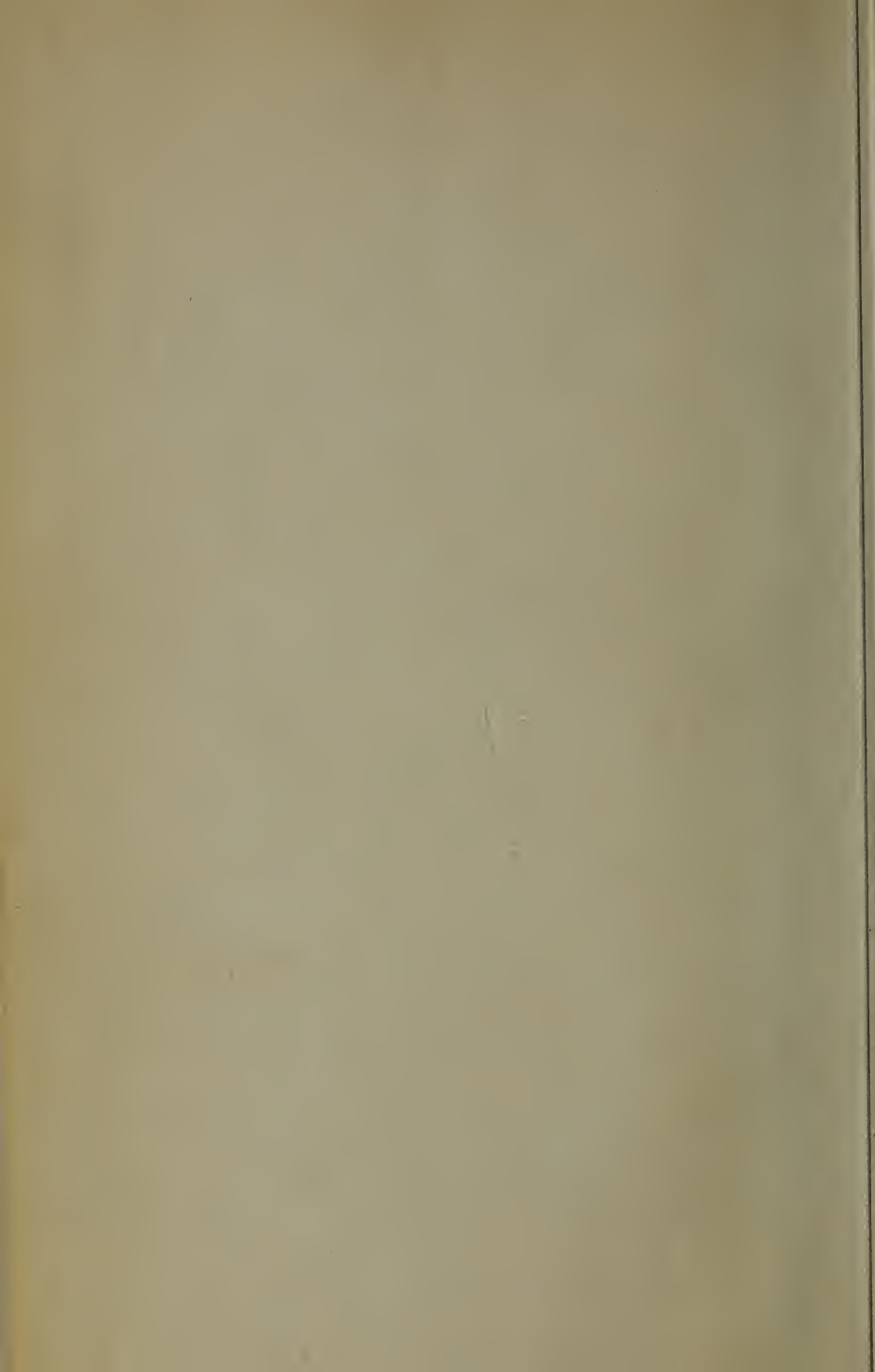
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August, 1908

BULLETIN

OF THE

Lowell Textile School

LOWELL, MASS.

SPECIAL BULLETIN

OF THE

Course in Textile Engineering

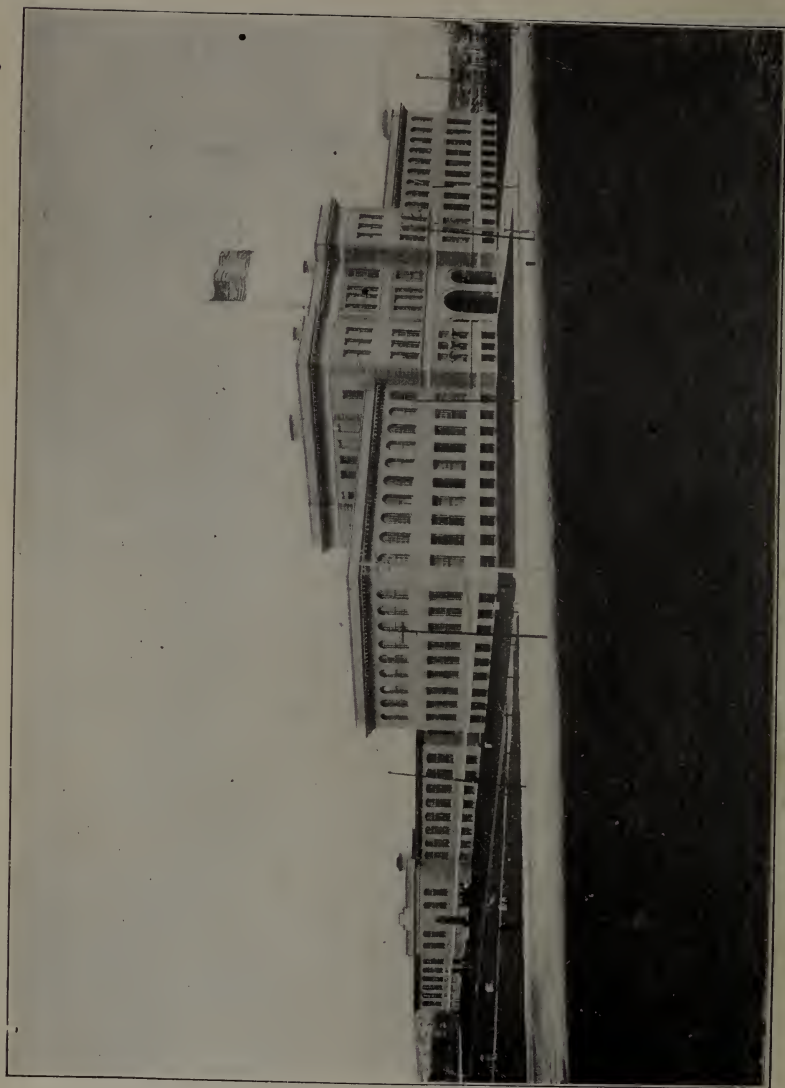
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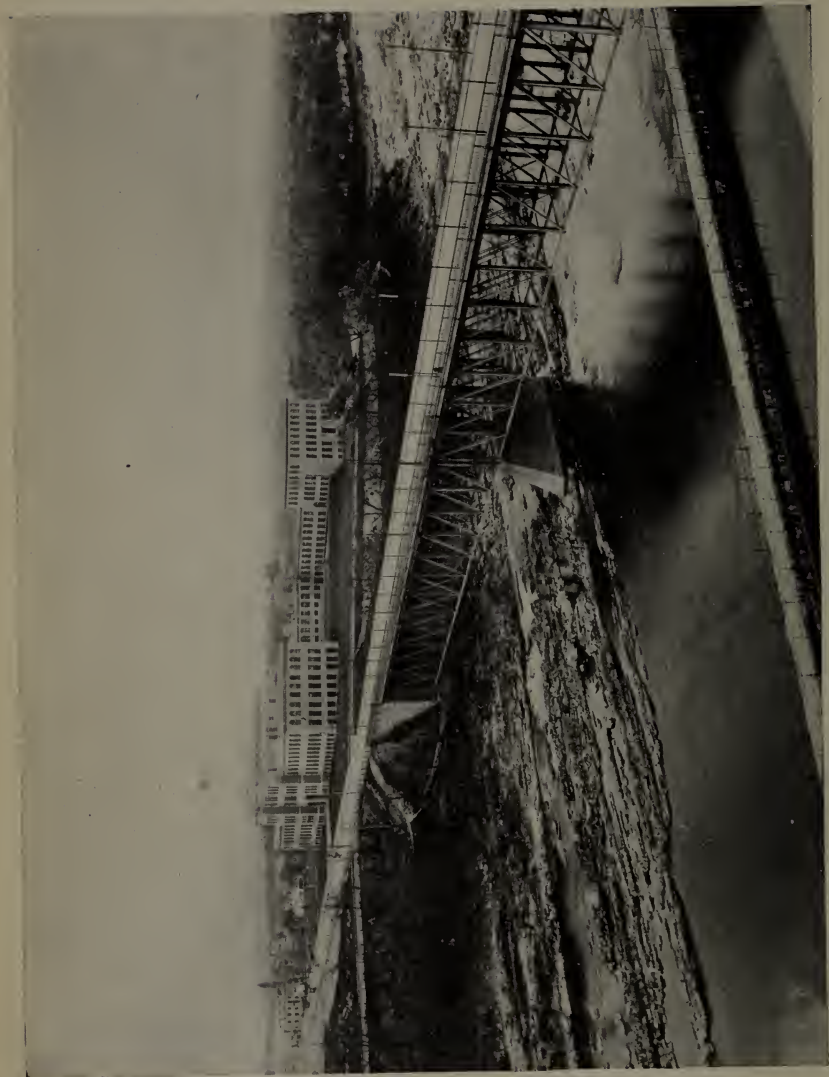
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GENERAL VIEW OF SCHOOL, MERRIMACK RIVER AND CANAL

Textile Engineering Course of the Lowell Textile School

INTRODUCTION

The course in Textile Engineering is planned to train the student to meet intelligently the engineering problems of the textile industry as well as to provide him with a thorough technical knowledge of the processes and machines of its varied branches. The demand from the industry for men with such training has led directly to the establishment of this course, although it had already been recognized that the textile graduate should have some instruction in engineering. While a thorough knowledge of the details of the textile processes gained by long training and experience is absolutely essential to the successful mill official, it is conceded that the majority of the managers of our large corporations devote a large portion of their time and attention to problems of a purely engineering character. Such matters as the construction of new mill buildings or the reconstruction of old ones, the "organization" of plants for economical and efficient production, maintenance and repairs, power transmission, measurement and distribution, power plant economies, and many allied problems are constantly arising in all modern textile mills. Most of these problems can be solved far more satisfactorily by trained men on the ground who are most familiar with the existing conditions and whose interests centre wholly in the corporation by whom they are employed. These statements are borne out by the successful experience of many of our best textile plants.

The fundamental principles of science and mathematics underlying all engineering work are first made a thorough ground work upon which are based the superstructure of the numerous



MECHANICAL AND MACHINE DRAWING ROOM

applications furnished by the textile industry and its many and closely allied branches. Special importance is attached to the study of power generation, transmission, and measurement, the arrangement and methods of driving textile machinery and the construction of mill buildings. The work in the textile branches proper, includes cotton, woolen and worsted spinning, power weaving, textile chemistry and the elements of design. Practical work is given in all of these branches and gives the student the requisite working knowledge of each. Machine shop practice, which is considered a most valuable adjunct to the training of an engineer, is given in a well equipped shop and the instruction conforms as nearly as is practicable to modern commercial methods. The subjects of mechanics, mechanism, machine drawing and mathematics in the preliminary work for this course are given in a most thorough manner, the practical uses of each subject being considered of prime importance. An extensive equipment for machine shop and engineering laboratory has been added this summer, making all possible provision for efficient instruction in the engineering branches. A detailed list of this new equipment is given in this bulletin while the complete equipment of textile machinery is given in the annual bulletin of the school, Series II, No. 4.

This brief statement of the object and broad scope of this course should give an indication of the character of work for which the graduate will be best prepared and in any textile mill, in machine shops manufacturing textile machinery, or in the offices of mill engineers, there are many opportunities for competent men with such a training.



ENGINEERING CLASS ROOM

COURSE VI.—TEXTILE ENGINEERING

FIRST YEAR

FIRST TERM

	Hours of Exercise		Hours of Exercise
Elements of Mechanism	60	General Chemistry	187
Mechanical Drawing	112	Freehand Drawing	15
Mathematics,—Algebra	30	Decorative Art	
Hand Loom Weaving and		English	15
Elements of Textile Designing	55	German or Spanish	20

SECOND TERM

Mathematics—Trigonometry	30	Textile Designing (Elements)	60
Machine Drawing	135	Hand Loom Weaving	55
Freehand Drawing	15	Cotton Yarn Manufacture	60
Elements of Mechanism	60	Gearing	15
Elementary Organic Chemistry	30	German	20
Textile Chemistry	15	English	15

SECOND YEAR

FIRST TERM

Advanced Mechanism	15	Mechanical Laboratory	45
Analytical Geometry	30	Electricity	30
Machine Drawing	75	Cotton Yarn Manufacture	120
Steam Engineering	30	Physics	30
Power Loom Weaving	30	Industrial History	15
Weaving Mechanism	15	Machine Shop	45
Textile Chemistry and Dyeing	30		

SECOND TERM

Analytical Geometry	30	Mechanical Laboratory	30
Machine Drawing	75	Electricity	45
Steam and Hydraulics	45	Woolen Yarn Manufacture	90
Physical Laboratory	45	Applied Mechanics	15
Power Loom Weaving	30	Industrial History	15
Weaving Mechanism	15	Textile Chemistry and Dyeing	15
Machine Shop	45		

THIRD YEAR

FIRST TERM

Worsted Yarn Manufacture	120	Mill Engineering Drawing	90
Differential, Integral Calculus	30	Power Plants	30
Mill Engineering	90	Applied Electricity	30
Physical Laboratory	45	Machine Shop	45
Finishing	30		

SECOND TERM

Worsted Yarn Manufacture	120	Mill Engineering Drawing	90
Differential, Integral Calculus	30	Physical Laboratory	45
Mill Engineering	45	Power Plants	30
Machine Shop	45	Electrical Laboratory	45
Finishing	30	Thesis	



BOILER ROOM

SUBJECTS GIVEN IN THE DEPARTMENT OF TEXTILE ENGINEERING

Elements of Mechanics and Mechanism

This subject is required by all courses and consists of ninety hours of lectures and recitations covering the whole of the first year. The fundamental principles of these subjects are considered of the greatest importance and the applications and problems are selected with special reference to their practical uses in textile machinery. The large variety of mechanism applications met in textile machines make this course an essential one as a proper preparation for the student's later work in spinning and weaving. During the second term a short time is devoted to a study of the principles of applied mechanics including strength of materials. This work finds its applications in the later study of mill construction. Students in Course VI are also required to take fifteen additional hours on gearing. Some of the subjects treated in this course are:

Mechanics

Work, power and energy.
Principles of moments.
Simple and compound levers.
Inclined plane and wedge.
Screw and worm wheel.
Parallelogram of forces.

Mechanism

Classification of motions.
Belting problems.
Gearing and gear trains.
Link motions.
Cams and cam design.
Differential and epicyclic trains.

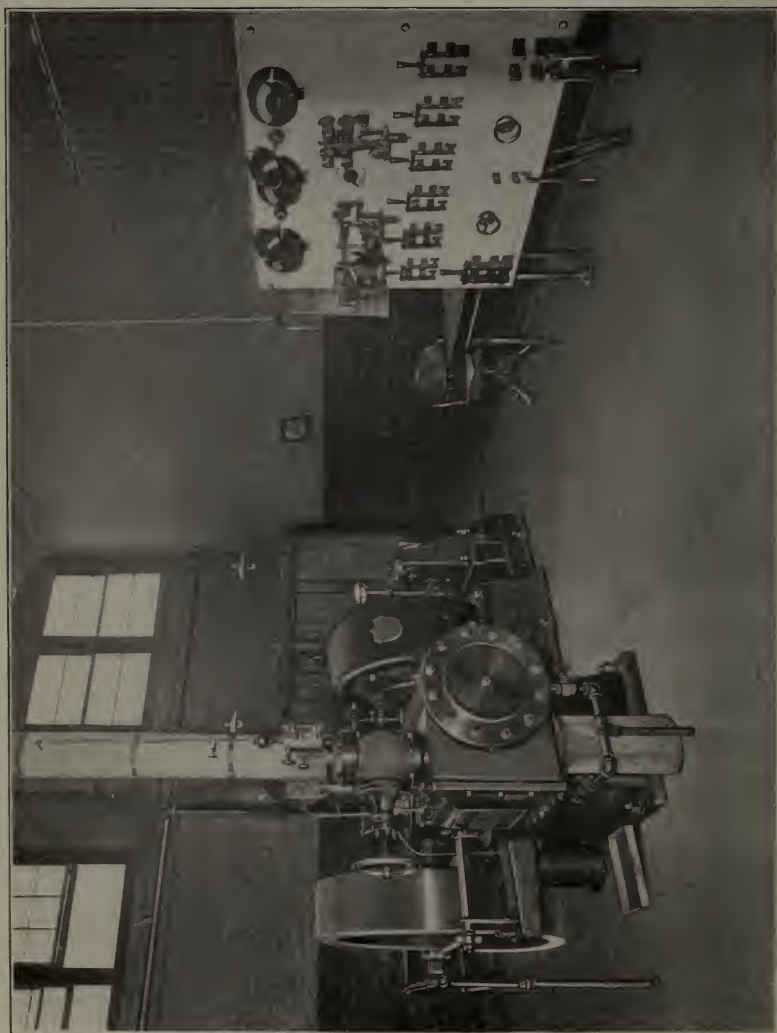
Mechanism of Power Weaving

This course consists of thirty lectures covering both terms of the second year and is required by all the regular students taking power weaving. A thorough analysis of all the important motions of power weaving is undertaken and the treatment is by graphical and analytical methods. The object of this course is to so familiarize the student with the theory of the mechanism of the loom that the time spent in the weave room on loom fixing is used to the best advantage.

Mechanical Drawing

This course is taken by all regular students during the first term of the first year. The weekly program consists of one lecture and five hours in the drawing room. This subject is considered of the greatest importance as a preparation for the student's future work and the practical usefulness of drawing of this character is fully emphasized. The course is systematically laid out covering in order the following divisions:

Care and use of drawing instruments.
Geometrical constructions.
Elements of projections and descriptive geometry.
Isometric projection.



STEAM ENGINE UNIT

POWER PLANT

Developments with practical applications.

Sketching practice on machine details.

A certain portion of the time is also devoted to the solution of graphical problems in connection with the course in mechanism and mechanics.

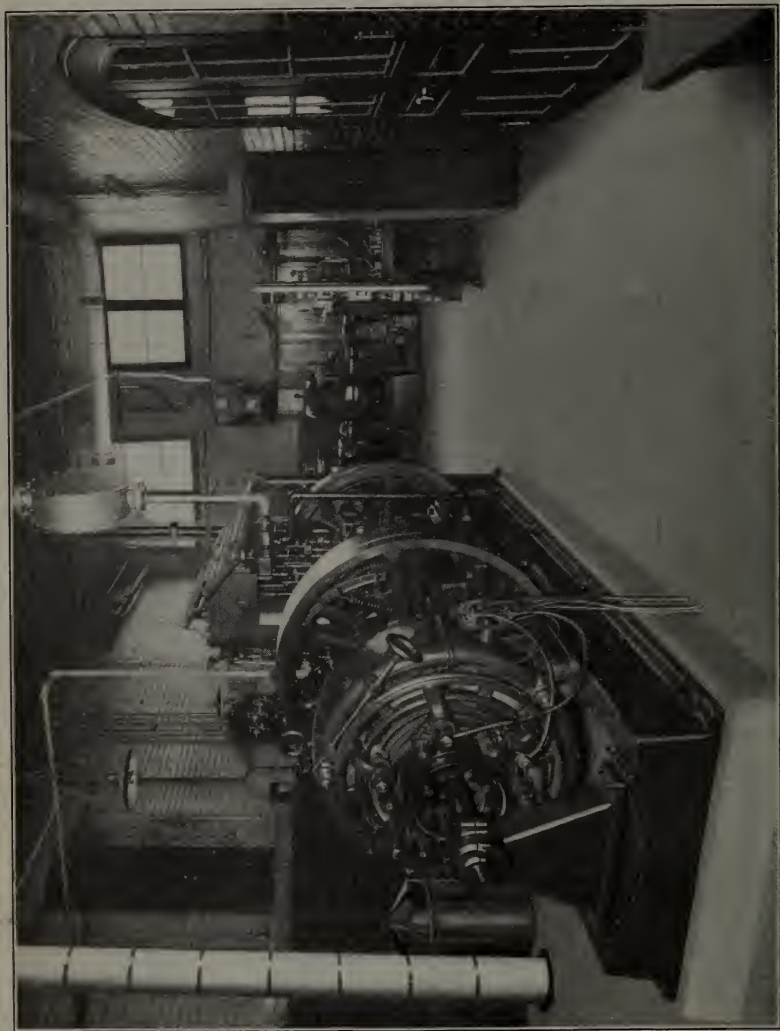
Machine Drawing

This work is the continuation of the mechanical drawing and covers seven hours per week during the second term of the first year. This work is wholly of a practical character and includes sketching from textile machinery details, working scale detail and assembly drawing, tracing and blue printing. Students in Textile Engineering being assigned additional time in the drafting room are enabled in many cases to complete a full set of detail drawings for an entire machine. They are also given the rudiments of machine design to supplement the work in strength of materials and machine shop practice.

During the second year all regular students except those of Course IV spend a period of two and one-half hours per week on a series of advanced graphical mechanism problems. The data for all of these problems is in every case taken directly from some of the textile machines that the students meet in other departments. These problems include cam designs for builder motions, mule scroll layouts, scaife builder motion, fly frame cones, mule quadrant motion and a number of others of similar character.

Mill Engineering

This course consists of forty-five lectures and thirty hours of drawing room exercises and is taken by all regular students except those in Course IV, during the third year. This work covers a wide range of subjects and is of the most practical character possible. All of the student's previous work in mechanics, steam engineering, and his knowledge of textile processes is here brought together in the consideration of the larger problems of mill design and "organization." A detailed study is made of the most modern types of mill buildings, including all calculations and drawings. Practice is also given with the engineer's transit and level in the field in plane surveying, setting batters, etc. A considerable time is devoted to a study of the methods of power transmission and the proper arrangement of textile machinery. The problems are in every case taken from actual conditions of mills already built or in process of construction. In addition to the regular exercises the students of the Textile Engineering course are given fifteen additional lectures on steam power plant design and steam plant economies. They are also given a large amount of additional time in the drawing room, enabling them to work out nearly all the problems involved in the design of an entire mill plant. Lectures and problems are also given on other features of mill engineering such as mill heating, ventilation and lighting, humidification and fire protection.



GAS ENGINE UNIT

POWER PLANT

Shop Practice

Systematic instruction is given in the most approved methods of machine shop practice, the object being to familiarize the student with the proper use of hand and machine tools and the characteristics of the different materials worked. Arrangements have been made with a local machine company of such a character as to give the work the greatest educational value and the important commercial element which stimulates the student's interest. Particular attention is given to the form, setting, grinding and tempering of tools and the mechanism of the different machines involving certain speeds, feeds, etc. The course is so planned that the instruction in each typical operation shall conform as nearly as possible to commercial machine shop practice on textile machinery. The list of tools given elsewhere in this bulletin gives an idea of the scope of the work which includes chipping and filing, tool grinding and tempering, straight and taper turning, screw cutting, drilling and boring, planer work, milling machine work, including gear cutting. Instruction is also given in use of wood working tools, both hand and machine and also in forging.

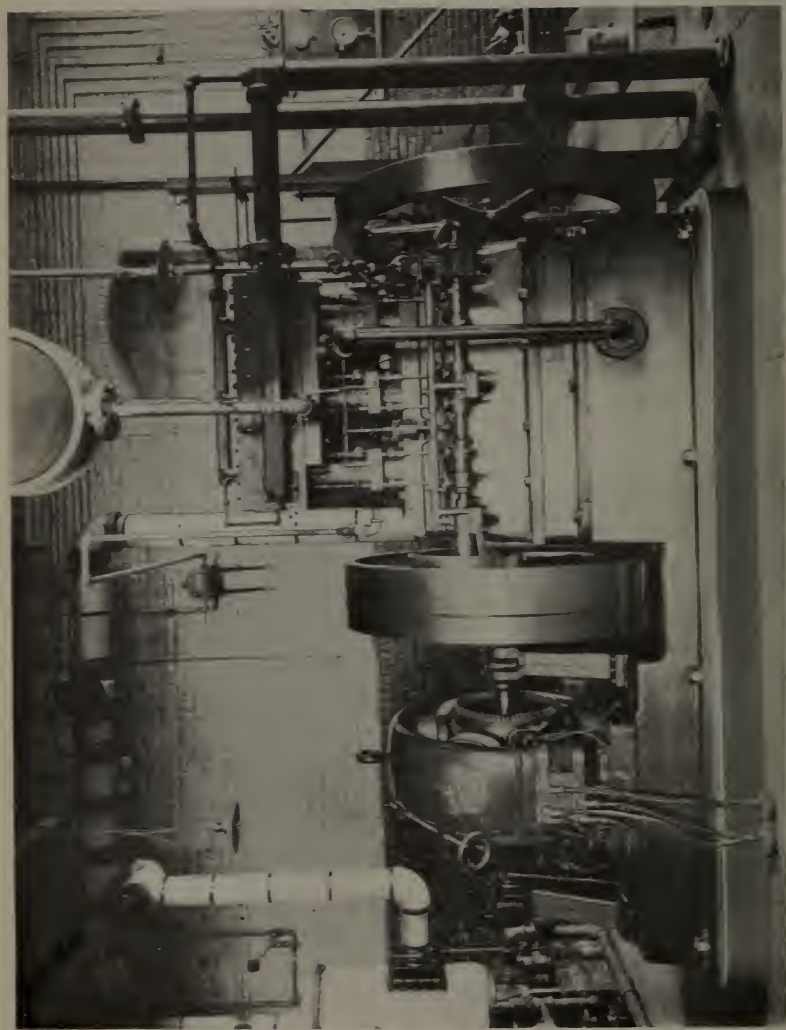
Steam Engineering

This course consists of forty-five lectures and is taken by all regular students during the second year. The purpose of this work is to familiarize the student with the essential elements of power generation and the means and methods of modern practice in power engineering. The principal phenomena of heat finding application in the steam plant are first thoroughly studied. This is followed by the subjects of fuels, furnaces, stokers, boilers, engines, turbines, condensers and other important features of a steam plant. The lectures pertain mainly to the principles, proper operation and efficient performance of these units, while a standard text book supplies the matter descriptive of the construction details and the different types. Practice with the steam engine indicator, boiler and engine tests are also included in this work. Some time is also given to the study of the modern gas engine and its applications.

In addition to the above, students in Textile Engineering are given fifteen additional lectures, going more fully into the theoretical thermodynamic principles underlying these subjects. They also have opportunity for practical work in a large number of tests in the Engineering Laboratory. (See Engineering Laboratory).

Hydraulics

This subject is presented in a course of fifteen lectures covering the principles of hydraulics, including hydrostatics, measurements of flow of water through orifices, pipes, nozzles and over weirs. The different types of turbines are studied with results of tests and rating tables. Course VI students pursue this course to greater length, supplemented by experiments in the laboratory.



POWER PLANT

GAS ENGINE UNIT

Electrical Engineering

This subject is conducted with the object of giving the students of all courses a general knowledge of the fundamental principles of electricity and magnetism together with the applications as they occur in the textile industry. The course commences with the second term of the second year and continues into the third year.

The instruction is given by means of lectures, recitations, and laboratory work and includes the subjects of Elementary electricity, Magnetism, Electrical Units, Measuring instruments, Direct current machinery, Generators, Motors, Switch board design, Systems of Transmitting power by electricity, Electric lighting, Storage batteries, Electrolysis, etc. Following this is a discussion of Alternating Current phenomena, A. C. Generators, Motors, and other apparatus required in the generation and distribution of power by electricity.

Particular attention is given to the applications of electrical engineering in the textile industry and the modern methods of electric driving of textile machinery are made the basis of special study.

Students of Course VI pursue this subject to a greater extent and carry on considerable laboratory work in conjunction with the lectures and recitations.

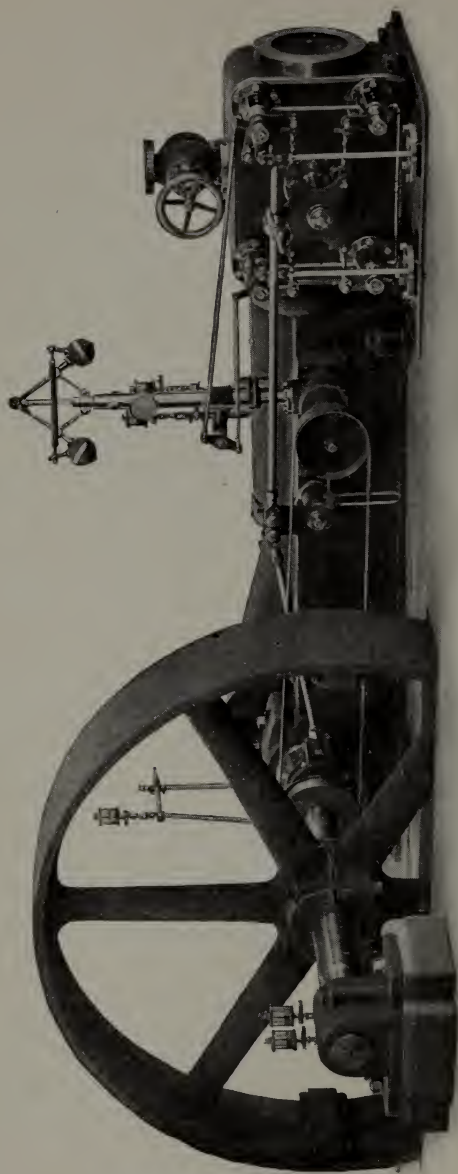
Mathematics

The subject of Advanced Algebra is taken up by the first year students during the first term. This is presented by means of lectures, class and problem work, and includes the subjects of Theory of Exponents, Quadratic Equations, Ratio and Proportion, Variation, Arithmetical, Geometrical and Harmonical Progression, Undetermined Coefficients, Binomial Theorem, Permutations and Combinations, Graphical Representation and Solution of Equations.

The subject of Plane Trigonometry follows the Advanced Algebra in the last part of the first term and is completed during the second term. Several exercises at the end of this course are devoted to instruction and practice in the use of the slide-rule.

Analytical Geometry

This course consists of sixty exercises given during the second year to students of the Textile Engineering Course. The instruction is given by lectures and class work and considers the subject heads of Loci, Straight Line, Common System of Co-ordinates, Transformation of Co-ordinates. The Circle, Conic Section, Parabola, Hyperbola and Ellipse. These are considered in the reference to both Polar and Rectangular Co-ordinates.



CORLISS ENGINE

ENGINEERING LABORATORY

Differential and Integral Calculus.

This subject is taken by all Course VI students and extends throughout the third year. It is arranged with the aim to give the students a working knowledge of the subject and to present its application to many engineering problems.

Physics

The course of General Physics is required of all second year regular students. The instruction is given by means of lectures and laboratory work and includes the following subjects:—The Laws of falling bodies, Mass, Density, Momentum, Mechanics, Elementary Principles of Hydrostatics, Sound, which includes a study of the means of propagating and determining velocity of sound, Interference of Sound Waves, Reflection and Refraction of Sound, etc. Considerable time is devoted to the subject of Light in accordance with the modern theory concerning its propagation, measurements of velocity, analysis and interference. The application of laws of mirrors, lenses and prisms as found in the microscope, spectroscope, etc., and consideration of the physical laws underlying color and color effects receive special attention.

Laboratory work is given during the second and third years with the purpose of familiarizing the student with the apparatus available for making general physical measurements as well as special apparatus used in testing textile materials. Particular attention is given to the method of making observations and the treatment and interpretation of the data so obtained.

Engineering Laboratory

This work is taken only by the students in the Textile Engineering Course during both terms of the second year. The following list of tests indicate the character of the work which is carried on in the engineering laboratory and power plant:

- Efficiency tests of chain block, jack screws, wedges, etc.
- Calibration and use of differential dynamometer.
- Determination of friction of belts.
- Calibration of gauges, thermometers and indicators.
- Use of different types of steam calorimeters.
- Tests on motor driven ventilation fans.
- Test of engine driven fan and heater.
- Test on steam injector and steam pumps.
- Triplex power pump tests.
- Air compressor test.
- Test on centrifugal pump.



MACHINE SHOP

Measurement of flow of water by orifices and weirs.
Corless engine tests condensing and non-condensing.
Valve setting.
Tests from 10 to 24 hours on 300 Horse Power Aultman and Taylor
or 200 Horse Power Stirling boilers.
Use of electrical measuring instruments for direct and alternating
current.
Generator tests. Direct and alternating current.
Motor tests and calibration for power measurements on textile ma-
chinery.
Determination of calorific value of coal.
Chimney gas analysis.
Economy tests on 50 Horse Power gas engine.
The tests are taken up in systematic manner and are timed to fol-
low as nearly as possible the lectures and recitations on the same topic.

Work of Engineering Students in other Departments

As the main object of the course is to acquaint the student with the principles of Engineering applied in the textile industry it naturally follows that he should be familiar with the processes and machines in use in that industry. To this end he is required to spend a portion of his time during the first two years in the Cotton Yarn Department and later during the second and third years to pursue courses in the Woolen and Worsted Yarn Department. During his last two years he devotes some time in the Weaving Department, to the end that he may understand the various types and makes of looms in use. Similarly in the Finishing and Knitting, special and shorter courses are provided for students of Course VI than are required of those taking any one of the regular manufacturing courses.

The instruction given in the Design Department during the first year upon the subject of Textile Designing and Cloth Analysis is the same as taken by all students of the manufacturing courses. In this time the student acquires the fundamental principles of design and is obliged to analyze several pieces of cloth illustrating the commonest weaves.

The importance of a knowledge of the fundamental laws of Chemistry, acquaintance with the properties of the common elements, as well as the reactions occurring when combinations are made, can not be over estimated in any engineering course. For a student in Textile Engineering a general knowledge of processes and machinery used in a dye house is of considerable importance. To give him this training is the object of the courses taken in the Chemistry and Dyeing Department.



MACHINE SHOP

Entrance Qualifications

Candidates for admission are accepted upon presentation of properly vouched certificate showing the completion of a regular four year High School course or equivalent. In the absence of such preparation the candidate will be required to pass entrance examination in Arithmetic, English, Geography, American History, Algebra, Plane Geometry. These are held in June and September. The details of the requirements in each subject are given in the general bulletin of the school.

The fee for the day course is \$100 per year for residents of Massachusetts. For non-residents the fee is \$150 per year and for students from foreign countries \$300 per year.

Three-fifths of the fee is charged for a single term. Payment for the first term is due on or before October 10th, the balance on or before February 10th of each year. After payment is made no fee or part thereof can be returned except to special action of the Trustees.

Students must provide their own books, stationery, tools, etc., and pay for any breakage or damage that they may cause. The above fee includes free admission to any of the evening classes in which there is accommodation, should any day student desire to attend.

Examinations

Formal examinations are held at the end of the first and second terms.

Intermediate examinations are held every five weeks and these serve to inform the student as to the progress made.

Daily work and regularity of attendance are considered in making up the reports of standing.

Twice during each term informal reports are sent to students, or to guardians of such as are not of age; and at the end of each term formal reports are made.

Diploma

All candidates for the diploma of the school must file with the Principal, not later than May 15, a report of some original investigation, or research, written on a good quality of paper 8x10 inches, with one inch margin at left, and 1-2 inch at right of each page, such thesis to have been previously approved by the head of the department in which it is made.

The diploma of the school is awarded upon the satisfactory completion of the full regular course, covering not less than three years, except where entrance is to advanced standing. In such cases at least one year's attendance is required.



MACHINE SHOP

ENGINEERING LABORATORY EQUIPMENT

Engineering Laboratory

The engineering laboratory contains the following equipment:

50 horse power Corliss (Reliance type) steam engine, from the Allis-Chalmers Co., Milwaukee, Wis. This engine is especially arranged for experimental purposes including condensing and noncondensing tests and is direct connected to an Alden absorption dynamometer of sufficient capacity to absorb and measure the full brake horse power available at the engine shaft. This engine is also connected to a Wheeler Admiralty Surface Condenser (cylindrical type) containing 200 sq. ft. of cooling surface mounted over a 5 in. x 6 in. x 6 in. x 7 in. combined air and circulating pump, from the Wheeler Condensing and Engineering Co., Carteret, N. J. The steam used by this engine is generated in a 100 horse power Stirling water tube boiler isolated from our service plant. Tanks of 10000 gallons capacity, supply the circulating water for the condenser. A system of spray cooling nozzles is installed to reduce temperature of cooling water.

In the main steam line to the engine is placed a 4 in. horizontal Cochran steam separator to insure dry steam for tests.

This equipment gives unusual facilities for a practical study of steam plant economies and operation, representing as it does the best types of commercial apparatus in use in textile mills.

A complete set of weighing and suction tanks and connections mounted on Fairbanks Standard Scales serves to measure all water used in boiler, engine and pump tests as well as for a variety of hydraulic experiments.

5,000 gallon pressure tank, 72 in. x 24 ft., giving heads up to 300 feet and arranged with connections for experimental work.

Two 2500 gallon concrete storage tanks.

Plans are made for the installation during the year of a 25 K. W. steam turbine and alternating current generator arranged for experimental work on this most modern form of prime mover.

Miscellaneous apparatus as follows give ample facilities for tests of a most useful and practical character:

One Deane Triplex power pump, 4 in. x 6 in.

One Clayton (belted type) air compressor, 6 in. x 6 in.

One 2 1-2 in. centrifugal pump.

One Metropolitan injector.

One rotary pump.

Two fan blowers for testing purposes.

Differential transmission dynamometer.

Variable speed transmission.

Instruments are provided in sufficient number to perform any test in an accurate manner and include steam and gas engine indicators, gauges, and gauge testers, planimeters, thermometers, barometers, calorimeters, counters, pyrometers, etc.

Apparatus is also available for the analysis of flue gases and the chemistry department is fully equipped for calorific determinations of fuels.

One 4 H. P. G. E. Electric Dynamometer which may be used as a double current generator or rotary transformer receiving direct current at 220 volts and delivering three phase alternating current which by a a step-up transformer will give 220 volts at 60 cycles.

One 5 H. P. induction motor.

One 250 volt Weston Portable Voltmeter.

One 250 volt Weston Portable Voltmeter with calibrating coil.

One 150 ampere Weston Portable Ammeter.

One Weston Portable Millivoltmeter with 200 milli-volt and 20 milli-volt scales.

One 2 ampere and one 20 ampere shunt for use with above instrument as an ammeter.

Set of alternating current instruments.

One D'Arsonval Reflecting Galvanometer.

One Simple Galvanometer.

One Wheatstone Bridge.

Two Direct Current Self Feeding Arc Lamps.

Two Hand Feed Arc Lamps for stereopticons.

Resistance boxes of various sizes and other apparatus necessary for commercial testing of lamps, motors, etc.

An Exhibition Board containing samples of the Chloride and Exide Storage Battery Plates donated by the Electric Storage Battery Co. of Philadelphia.

Physical Laboratory

Through the generosity of a friend of the School a laboratory has been provided with the most approved apparatus for testing the physical properties of all fibres, yarns, and fabrics; the equipment includes:

One Bausch and Lomb D. D. Microscope.

Two inch, 1 inch, and 1-2 inch regular eyepieces.

Three-fourths inch (photographic), 2-3 inch, 1-6 inch, 1-12 inch (oil immersion) objectives.

One Nicol prism polarizer and analyzer.

One Eye Piece Micrometer.

One Filar Micrometer, (1 inch equivalent eyepiece) for refined diameter determinations.

One Standard Glass Stage, divided to 1-10 and 1-100 m. m. with corrections as tested against the International m. m.

Complete outfit for mounting slides.
 Complete outfit for photo micrography.
 Camera Lucida.
 Microtome Sectioning Outfit.
 One Small Skein Testing Machine.
 One set Conditioning ovens for moisture determination.
 One Yarn Testing Machine, adjusted to test strength, twist, take up, elasticity, and stretch.
 One Hydraulic Cloth Strength Testing Machine.
 One Brown & Sharpe Metre Reel.
 Miscellaneous apparatus for experiments in Mechanics, Heat, Light, Sound and Electricity.

Power, Heat, Light and Ventilating Plant

One 300 H. P. Aultman and Taylor Horizontal Water Tube Boiler, equipped with U. S. Rocking Grates and set with extension (Dutch Oven) Furnace.
 Two 100 H. P. Stirling Water Tube Boilers. One of these boilers is so arranged that it can be isolated for test purposes and supplies steam for the engineering laboratory. The draft for the boilers is maintained by a Sturtevant Induced Draft Apparatus including engine driven fan, smoke filter and two way dampers.
 One Payne 14 in. x 14 in. Automatic High Speed Engine of 125 H. P.
 One 9 1-2 in. x 11 3-4 in., three cylinder, Nash Gas Engine of 50 H. P.
 This engine is of the four cycle type, operating on gas from the street mains.
 One Knowles Boiler Feed Pump, 6 in. x 4 in. x 6 in.
 One Deane Boiler Feed Pump, 6 in. x 4 in. x 6 in.
 One Locke Pressure Regulator for draft fan engine.
 One Warren Webster Feed Water Heater, filter on oil extractor.
 One Motor Driven Air Compressor with storage tanks.
 One Complete Sturtevant Double Duct System for heating Southwick Hall. This apparatus is designed to provide the proper amount of fresh warm air called for by the State law as applied to educational institutions, and includes a 9 ft. x 4 ft. fan direct connected to the Sturtevant horizontal engine, drip tank and Knowles automatic return pump, 4 1-2 in. x 2 3-4 in. x 4 in. arranged to deliver either to the feed water heater or to the boilers direct.
 Complete Ventilation System for Southwick Hall and Falmouth Street Building including 6 direct connected motor driven exhaust fans.
 One Sturtevant Fan and Heater for Kitson Hall and Falmouth Street Building, direct connected to a Sturtevant inverted engine.
 One Cross Oil Filter.

One Complete Moistening Apparatus installed by the American Moistening Co., Boston, Mass., including Knowles triplex 4 x 4 power pump, tank, and 20 moistening heads.

One Moistening Apparatus with Thompson's Turbo Heads, installed by the G. M. Parks Co., Fitchburg, Mass.

One Complete Sprinkler System for fire protection, using the Grinnell glass button heads.

One Bullock 75 K. W. Direct Current Multipolar Compound Generator, wound for 220 volts, over compounded 20 volts from no load to full load. This is direct connected to the Payne engine.

One Bullock 30 K. W. Generator of the same type, direct connected to the Nash gas engine.

The switchboard is arranged so that either unit may be thrown in independently on the power or lighting feeders or the two machines may be run in parallel. The lighting circuits are on the two wire 220 volt system and supply the equivalent of 103c—16 candle power lamps. The power circuits are on the same system and supply approximately 170 H. P. in motors.

Three 24 H. P. Bullock Motors.

One 20 H. P. General Electric Motor.

One 10 H. P. Allis Chalmers Motor.

Two 7 1-2 H. P. General Electric Motors.

Four 15 H. P. Bullock Motors.

One 3 H. P. Motor, New England Motor Co.

One 2 H. P. Motor, Holtzer-Cabot Electric Co.

Machine Shop

The equipment of the machine shop is as follows

One standard engine lathe, 13 inch swing, 6 foot bed, from Flather & Co., Nashua, N. H.

One new model quick change engine lathe, 14 inch swing, 6 foot bed, from Flather & Co., Nashua, N. H.

One standard engine lathe, 18 in. swing, 10 foot bed, with taper attachment, from Flather & Co., Nashua, N. H.

Two speed lathes, 11 in. swing, 5 foot bed, from J. G. Blount, Everett, Mass.

One 23 inch unright drill, with back gears and power feed, from J. E. Snyder & Son, Worcester, Mass.

One 14 inch single spindle sensitive drill, from the Stanley Mfg. Co., Lawrence, Mass.

One 24 in. x 24 in. x 6 ft. planer, from the Mark Flather Planer Co., Nashua, N. H.

One No. 1, Universal Milling Machine with all three feeds automatic, from the Kempsmith Mfg. Co., Milwaukee, Wis.

One 20 inch wet tool grinder, from J. G. Blount, Everett, Mass.
One 12 inch, two wheel, dry grinder, from J. G. Blount, Everett, Mass.
One 30 inch grindstone and frame, from the Athol Machine Co., Athol, Mass.

One single spindle centering machine, from the D. E. Whiton Machine Co., New London, Conn.

One power hack saw, from the Fairbanks Co., Boston, Mass.

These tools are fully equipped with chucks, centres, tools, etc., for a great variety of work. Benches with vises are also provided for such work as chipping, filing, etc.

A thoroughly equipped tool room contains an ample stock of the best makes of small tools such as drills, taps and dies, milling cutters, reamers, gauges, micrometers, etc.

The following wood working tools are also provided in addition to benches for pattern making:

One pattern maker's lathe, 16 in. swing, 8 foot bed, from Fay & Scott, Dexter, Me.

One 32 in. band saw, from the Crescent Machine Co., Leetonia, O.

One iron single saw bench, from the Crescent Machine Company, Leetonia, O.

Two blacksmith forges, anvils and tools are also provided, and a gas oven for hardening and tempering tools.

DONATIONS

The following donations have been received during the past year:

One 4 in. Cochrane steam separator (horizontal type)

One exhibit board of steam and water valves, from the Fairbanks Company, Boston, Mass.

One sectional model of steam injector, from Shutte & Koerting.

One sectional model of high pressure valve, from Hancock Inspirator Company, Boston, Mass.

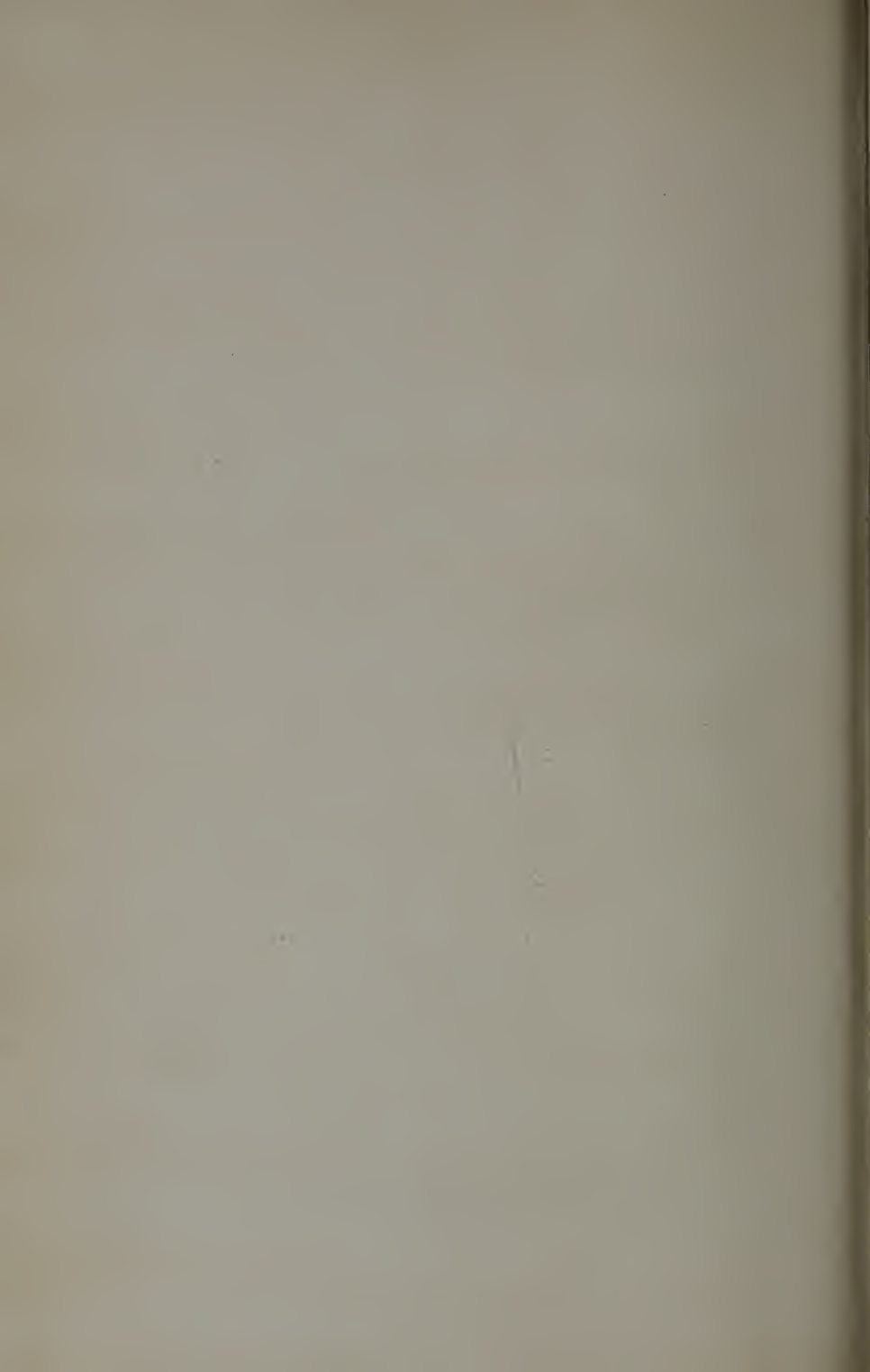
Blue prints, from Flather & Co., Nashua, N. H., and the Kempsmith Mfg. Co., Milwaukee, Wis.

EVENING CLASSES

For students unable to attend the day classes, instruction is given four evenings per week for approximately twenty weeks. Classes open usually on or about October 15, and close April 1.

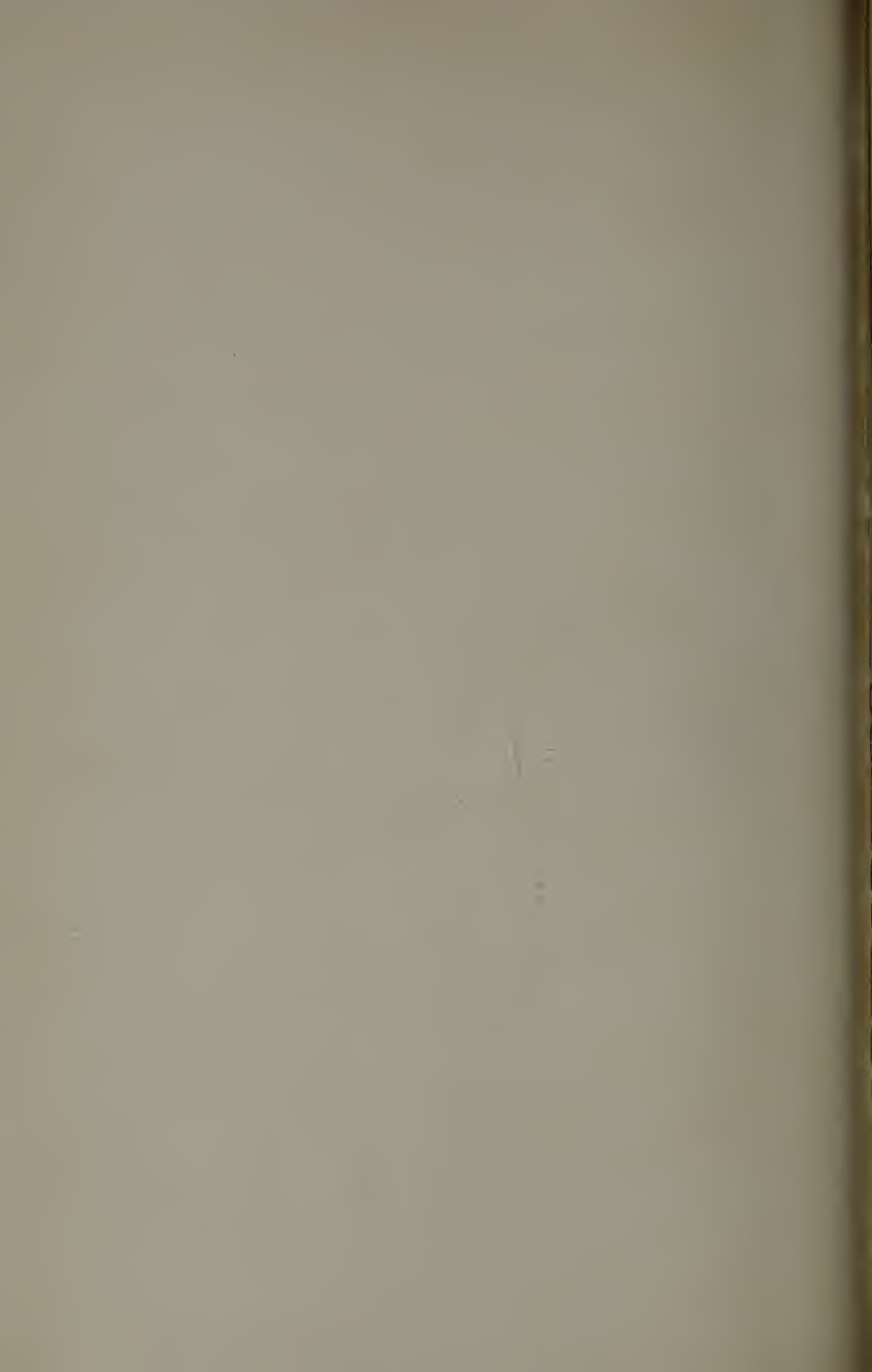
Instruction is given in Mechanism, Steam Engineering, Electrical Engineering, Mechanical and Architectural Drawing and Shop Practice. The details of the several subjects are essentially the same for the day classes and have been described on pages 13-19.

For a three year course comprising one year each of Mechanism, Steam Engineering, and Electrical Engineering, a certificate is awarded. A certificate is also awarded for a three year course in Mechanical or Architectural Drawing.



**Positions Attained by Graduates of Day Courses
Since Graduation.**

Principal of textile school or departments,	3
Teacher, industrial school,	10
Mill owner,	1
Mill corporation treasurer,	1
Mill agent,	3
Mill superintendent,	11
Mill assistant superintendent,	9
Mill assistant manager,	1
Mill foreman of department,	18
Mill purchasing agent,	1
Mill auditor and accountant,	8
Textile designer,	28
In commission house,	8
Electrician,	1
Assistant engineer,	1
Draughtsman,	3
Chemist and dyer,	23
In business, textile distributing or incidental thereto,	26
Journalist,	2
Student,	1
Deceased,	2
<hr/>	
Total, to January 1, 1908	161



BULLETIN

OF THE

Lowell Textile School

Lowell, Massachusetts, U. S. A.



ISSUED QUARTERLY

Entered Aug. 26, 1902, at Lowell, Massachusetts
as second-class matter under Act of
Congress, July 16, 1894

Moody Street and Colonial Avenue

FOR BULLETIN AND TERMS ADDRESS CHAS. H. EAMES, PRINCIPAL

Profits resulting from Textile Schools

It is a recognized law of mechanics that in any system of forces, however complicated, each force produces its effect in both magnitude and direction independently of all the other forces acting. It is also possible to analyze any resultant of system of forces and find the value of any component acting in any particular direction. Thus dealing with forces of this character it is possible to study them both synthetically and analytically, but it is not so easy to study other kinds of forces, as for instance those operating in the social, educational, commercial, or manufacturing world. It is seldom if ever possible to measure such forces with the ease or surety that is possible in mechanics. We are, however, dealing with just such forces when we try to determine the exact magnitude of the "resultant effect" which the industrial educational movement has exerted in all the varied departments of our complicated and social world.

Perhaps in no branch of industry has this movement been more thoroughly developed and matured than in the textile.

But to show accurately the exact effect of this particular movement—that is, the extent of improvement—either by increased production or better quality of goods; in raising the social standing of the employees, or bringing to light higher and better trained foremen and superintendents, as well as placing technically trained men at the head of the leading textile establishments, is to attempt the analysis of one of the greatest forces which has but just commenced to be felt.

The Management of the Lowell Textile School has from the opening of the school recognized the need of better trained men in the industry; has kept constantly in mind the purpose of the school as set forth in its charter—to give instruction in the sciences and arts applicable to the textile and kindred industries, has endeavored to feel the pulse of this industry in order to determine its needs; has kept in close contact with the success and shortcomings of the men who have gone out into the world, and has the one purpose of raising the standard of excellence of each

succeeding graduating class. The successes of its Alumni, the requests of the industry for the graduates, the increasing numbers of new students who come to the school because of the reputation made by the school and its graduates, are but "signs of the times." The fact that the school has just made the greatest increase in number of students during a year when the whole country feels a financial stringency, may be taken as some measure of the value which the industry itself places upon the work of the school.

Figures are always interesting and convincing.

Results of a recent canvas of the Alumni lead to the belief that nearly 60 per cent. of the graduates from the day classes are receiving a salary of over \$1000 a year; 20 per cent. are receiving \$2000 and over, with some cases of \$4000, \$5000, and \$7000, salaries. The first graduate has not yet been out from school ten years. The following is a list of the number of graduates occupying the different positions in the industry—this includes the Class graduating in June, 1908.

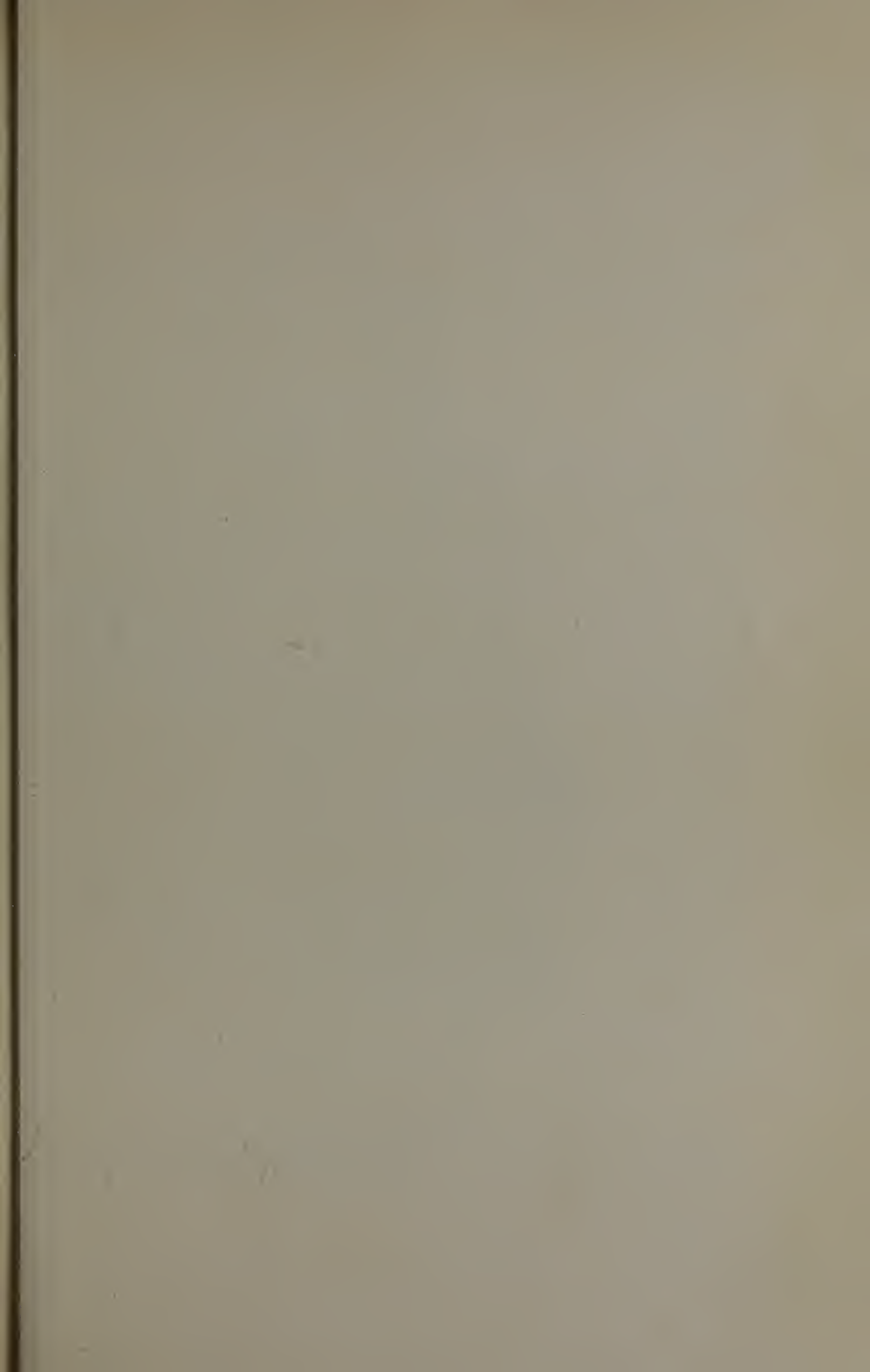
Positions Attained by Graduates of Day Courses since Graduation

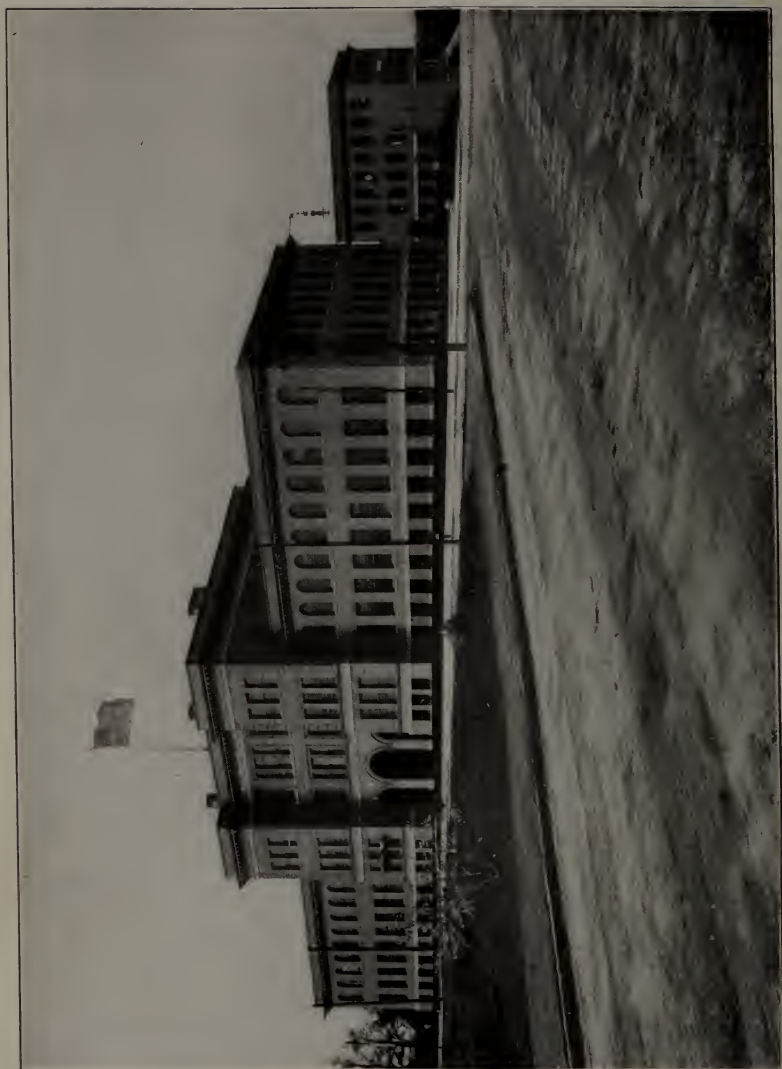
Principal of textile school or departments	3
Teacher industrial school	11
Mill owner	1
Mill corporation treasurer	1
Mill agent	3
Mill assistant superintendent	9
Mill superintendent	11
Mill assistant manager	1
Mill foreman of department	18
Mill purchasing agent	1
Mill auditor and accountant	8
Textile designer	30
In commission house	8
Electrician	1
Assistant engineer	1
Draughtsman	3
Chemist and dyer	29
In business, textile distributing or incidental thereto	33
Journalist	2
Student	2
Deceased	2

The cases which so frequently come to us of improved conditions of young men daily working in the mills and shops, but who have taken evening courses at the school show that this branch of the work has its uplifting influence upon the industry. There are many examples of young men who have risen from the ranks to positions of overseers and superintendents because they had acquired the technical training in some evening course of study at the school pursued diligently and with determination at the sacrifice of many an evening of rest and recreation, and possibly at the expense of their physical strength and endurance. A notable example of this is found in a young man who has risen to the agency of the largest worsted mills in this country. To say that such cases of success are due entirely to the technical training, is to shut our eyes to the varied factors and qualifications which enter into the attainment of any desired positions. Personality, opportunity, energy, thrift, and many other qualities must be combined with the technical training to make for the greatest success. That textile schools for instruction in the sciences and technics of the industry have come, not only to stay but to grow to have an increasing effect cannot be disputed. They are acquiring the same position relative to the industry that the great technical schools of the country occupy to the engineering profession. They prepare a young man to be earlier in his life of more economic value and also give him a foundation upon which he can build and climb to the highest position within the limits of his qualifications.

The result at the end of the second decade of their existence will be more marked even than it is at the end of the first.







SOUTHWICK HALL

FALMOUTH STREET BUILDING

SERIES 12. No. 3.

February, 1909

BULLETIN
OF THE
Lowell Textile School
LOWELL, MASS.

Issued Quarterly

1909 - 1910

Entered August 26, 1902, at Lowell, Mass., as second class matter,
under Act of Congress of July 16, 1894.

Moody Street and Colonial Avenue



KITSON HALL AND CAMPUS

SOUTHWICK HALL

Trustees of the Lowell Textile School

(Incorporated 1895)

Honorary Trustees

FREDERICK FANNING AYER

New York City

*CHARLES L. HILDRETH

Lowell

The Corporation

Officers, 1909

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JAMES T. SMITH, CLERK

JACOB ROGERS, VICE-PRESIDENT

A. G. POLLARD, TREASURER

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On the part of the Commonwealth of Massachusetts

Ex-Officiis

HIS HONOR LOUIS A. FROTHINGHAM

Lieutenant Governor

HON. GEORGE H. MARTIN

Secretary Board of Education

Appointed by the Governor and Council

JACOB ROGERS, Lowell, 1908

Banker

FRANKLIN W. HOBBS, Brookline, 1910

Treasurer Arlington Mills

On the part of the City of Lowell

Ex-Officiis

HON. GEORGE H. BROWN

Mayor of Lowell

A. K. WHITCOMB

Superintendent of Public Schools

ARTHUR L. GRAY

Chairman Board of Aldermen

STANLEY E. QUAA

President Common Council

By appointment of the Lowell Textile Council

MICHAEL DUGGAN, 1907.

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HENRY A. BODWELL, Andover, Supt. Smith & Dove Manfg. Co. Class, 1900

WILLIAM E. HALL, Lowell, Treasurer Shaw Stocking Company

WILLIAM R. MOORHOUSE, Boston, Mass., Color Chemist, Cassella Color Company. Class of 1901.

Additional Trustees Elected by Alumni Under Act of 1905

For Four Years, from June 30, 1906.

ROYAL P. WHITE, Class of 1904, Superintendent Stirling Mills, Lowell, Mass.

For Four Years, from June 30, 1907.

T. ELLIS RAMSDELL, Class of 1902, Agent Monument Mills, Housatonic, Mass.

For Four Years, from June 30, 1908.

DEXTER STEVENS, Class 1904, Yarn Superintendent, Lancaster Mills, Clinton, Mass.

For Three Years, from June 30, 1906.

ARNOLD J. MIDWOOD, Class of 1905, Chemist, Levinstein & Company, Boston, Mass.

*Deceased



GENERAL VIEW OF SCHOOL, MERRIMACK RIVER AND CANAL

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FREDERICK A. FLATHER A. G. POLLARD JAMES T. SMITH
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ROYAL P. WHITE

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FRANKLIN NOURSE, Chairman HENRY A. BODWELL
FRANKLIN W. HOBBS JAMES T. SMITH
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FRANKLIN NOURSE, Chairman WILLIAM E. HALL

Woolen and Worsted Spinning

FRANKLIN W. HOBBS, Chairman FREDERICK A. FLATHER

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THOMAS WALSH, Chairman FREDERIC S. CLARK
WILLIAM R. MOORHOUSE

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Athletics

JAMES T. SMITH, Chairman
WILLIAM R. MOORHOUSE ROYAL P. WHITE



ASSEMBLY HALL

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Professor of Textile Design and Fabric Structure;
in charge of Department of Design and Power
Weaving

LOUIS A. OLNEY, A. C., M. S.

Professor of Chemistry; in charge of Department
of Chemistry and Dyeing

EDGAR H. BARKER,

In charge of Department of Woolen and Worsted
Yarns

GEORGE H. PERKINS, S. B.,

In charge of Department of Textile Engineering

ARTHUR A. STEWART,

In charge of Department of Finishing

STEPHEN E. SMITH,

In charge of Department of Cotton Yarns and
Knitting

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Instructor in Textile Design and Cloth Analysis

JOSEPH WILMOT,

Instructor in Power Weaving and Warp Preparation

JOHN N. HOWKER,

Instructor in Wool Sorting and Scouring

STEWART MACKAY,

Instructor in Hand Loom Weaving

ROBERT R. SLEEPER,

Instructor in Dyeing

JOHN B. REED, A. B.,

Instructor in Chemistry

EUGENE W. CLARK, JR.,

Instructor in Freehand Drawing and Decorative Art



COTTON YARN DEPARTMENT

Officers of Instruction—Continued

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Instructor in Mechanical Engineering and Mathematics.
- HENRY H. CROMPTON,
Instructor in Worsted Yarns
- JOHN R. WALMSLEY,
Instructor in Cotton Power Weaving
- ELIZABETH WHITNEY,
Instructor in Freehand Drawing
- WALTER B. POPE, B. S.,
Instructor in Chemistry
- ULYSSES J. LUPIN, S. B.,
Instructor in Mathematics, Physics and Electrical Engineering
- ALBERT E. MUSARD,
Instructor in Jacquard Weaving
- EUGENE C. WOODCOCK,
Instructor in Woolen Yarns
- GEORGE A. CUSHMAN, A. M.,
Instructor in Chemistry and English
- JAMES G. COMAN, B. Sc.,
Instructor in Cotton Yarns and Knitting
- GEORGE W. HATHORN,
Instructor in Dyeing
- WALTER E. HADLEY,
Instructor in Chemistry
- PAUL E. KUNZER, PH. D.,
Instructor in Commercial Languages
- FREDERICK A. WOOD, PH. D.,
Instructor in History
- FELIX D. LANGEVIN,
Instructor in Machine Shop Practice

Faculty

CHARLES H. EAMES
FENWICK UMPLEBY
LOUIS A. OLNEY
EDGAR H. BARKER

GEORGE H. PERKINS
STEPHEN E. SMITH
ARTHUR A. STEWART

CALENDAR FOR 1909 - 1910

1909

1910

JULY

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

JANUARY

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
$\frac{23}{30}$	$\frac{24}{31}$	25	26	27	28	29

AUGUST

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

FEBRUARY

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28					

SEPTEMBER

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30		

MARCH

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

OCTOBER

S	M	T	W	T	F	S
				1	2	
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
$\frac{24}{31}$	25	26	27	28	29	30

APRIL

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

NOVEMBER

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

MAY

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

DECEMBER

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

JUNE

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30		

CALENDAR

1909

Semi-annual examinations begin Tuesday, January 19.
Second term begins Monday, February 1.
End of first five-week period of second term, March 6.
End of second five-week period of second term, April 10.
Annual examinations begin Tuesday, May 18.
Certificates awarded to Evening Graduates, May 5.
Diplomas awarded to Day Graduates, Thursday, June 3.
First entrance examinations, June 21 and 22, at 9 a. m.
Fall entrance examinations, September 13 and 14, at 9 a. m.
Re-examinations and examinations for advanced standing, commence Friday, September 17, at 9 a. m.
Entrance examinations for evening students, Thursdays, commencing September 30, at 7 p. m., continuing until opening of classes.
Day school year begins Tuesday, September 28.
Evening school year begins Monday, October 18.
End of first five-week period of first term, October 30.
Thanksgiving recess, Thursday, Nov. 25 to Saturday, Nov. 27, inclusive.
End of second five-week period of first term, December 4.
Christmas recess, Friday, Dec. 24, to Monday, Jan. 3, 1910, inclusive.

1910

Semi-annual examinations begin Tuesday, January 18.
Second term begins Monday, January 31.
End of first five-week period of second term, March 5.
End of second five-week period of second term, April 9.
Annual examinations begin Tuesday, May 17.
Certificates awarded to Evening Graduates, May 4.
Diplomas awarded to Day Graduates, Thursday, June 2.
Entrance examinations, June 20 and 21, at 9 a. m.

There will be no sessions of the school on Washington's birthday or on Patriots' Day.



The Lowell Textile School

The Lowell Textile School was established, and is managed, by the Trustees of the Lowell Textile School of Lowell, Massachusetts, "for the purpose of instruction in the theory and practical art of textile and kindred branches of industry," as set forth in the act of incorporation.

The movement for the establishment of the School dates from June 1, 1891, but it was not opened for instruction until February 1, 1897.

Not only did the normal progress of the textile industry require such a school, but through the rapid development of the manufacture of the coarser cotton fabrics in the southern states, a crisis had arrived in the leading industry of New England which could only be met by wider and more thorough application of the sciences and arts for the production of finer and more varied fabrics.

Modeled on the lines of the department of the higher Polytechnic Institutes, it offers thorough instruction in the elements and principles of the sciences and arts applicable to textile and kindred branches of industry and also in their application to the manufacture of all varieties of textile fabrics, and the machinery required therefor.

In industrial education the distinction between Trade and Technical Industrial Schools is coming to be understood. The Lowell School belongs to the latter class. Beginning with limited equipment, instruction staff, and means, instruction at first was by Mill or Trade school methods—the pupil was brought directly to the machine, its parts explained to him, and its operation in manufacturing. The curriculum was, however, rapidly extended, department after department opened and equipped, and commodious and well adapted buildings provided for a permanent home.



While the progress of invention and the demands of ever changing markets will compel constant improvement in methods and additions to the very extensive equipment, the period of establishment is substantially closed with all departments open for instruction in all branches of the textile art under an extensive and able corps of instructors.

Of the incorporators the permanent trustees (limited to twenty) are mainly representatives, as president, treasurer, agent, or superintendent, of the management of great textile or textile machine corporations of the Commonwealth, and associated with them are, ex-officiis, His Honor, the Lieutenant Governor and the Secretary of the State Board of Education, and two trustees appointed for four-year terms by the Governor and Council. Also the Mayor, Superintendent of Schools, the presiding officers of the two branches of the City Council, and a representative of the textile council of the city of Lowell. At the session of 1905 the Legislature authorized the graduates of the school to elect two additional trustees, and by an act of 1906 the number was increased to four for four-year terms, one being elected each year.

By the terms of the by-laws at least three-fourths of the permanent trustees must be persons "actually engaged in or connected with textile or kindred manufactures."

Lowell, Massachusetts, is called the "Mother Textile City of America," and in locating the school at this center a considerable advantage is secured for the reason that every commercial fibre is utilized in the products of the great Merrimack Valley Textile district. The practical work of the school is therefore kept closely in touch with the several branches of the industry which are included in the courses of study.

His Excellency, Governor Roger Wolcott, formally opened the school on January 30, 1897, there being present a large and representative gathering of gentlemen from the textile industries in all portions of New England. The regular classes of the school were opened on February 1, 1897, and have been regularly conducted since that time.

His Excellency, Governor John L. Bates, dedicated the buildings forming the permanent home of the school on February 12,



COTTON YARN DEPARTMENT. COMBING

1903, in the presence of a large number of guests representing the Legislature as well as the educational, textile, and commercial interests of the Commonwealth.

It is found as time goes on that the applicants for day classes should enter more thoroughly prepared, and it now seems advisable that all students should enter the Lowell Textile School with a preparatory training which is the equivalent of that afforded by the regular four-year course of a standard high school. Even in such cases it is necessary to include in the curriculum of this school the branches of General Chemistry, Decorative Art, Mechanics and Advanced Mathematics. These subjects must be taught in a most thorough manner, for upon these depend the value and standing of the graduate in the great textile industries. While one may acquire at the school thorough knowledge of the principles of the sciences applicable in widely diverse lines of industry, he is taught these principles with the particular view to their application to textile problems and processes. For graduates of universities and scientific institutions, special applied textile courses are offered or opportunities for experimental and original research work.

The mechanical equipment of the school includes the best makes of textile machinery, and these machines, while built as they would be for regular work, are, so far as possible, adapted to the experimental work which is of particular value in such an institution as this.

There is a more varied equipment in this school than in any other, either in America or Europe, and it is now possible to convert the raw stock into the finished fabric, within the school.

The growth of the school has been constant, as is evident from the fact that when it was opened February, 1, 1897, there were 32 day and 110 evening pupils. January 1, 1909, the roster showed 173 day pupils and 505 evening pupils or 678 in all. The day roster shows the phenomenal increase this year of 34 percent.

On January 1, 1903, the School was transferred from the rented quarters that it had occupied for five years to the site and buildings where it is permanently located.

The site is a commanding one, consisting of about eighteen acres at a high elevation, on the west bank of the Merrimack



WOOLEN AND WORSTED YARN DEPARTMENT

River, extending to and overlooking the rapids of Pawtucket Falls, the first to be utilized for power weaving in America on an extensive scale. The site was contributed by Frederick Fanning Ayer, Esq., of New York City, and the Proprietors of the Locks and Canals on the Merrimack River. To this site has been added three acres through the continued liberality of Mr. Ayer. The buildings consist of Southwick Hall, Kitson Hall, and one on Falmouth Street not yet named.

Southwick Hall includes a central mass 90 x 90 ft., having three stories and two wings 80 x 85 ft. with two stories and a well lighted basement. The building is pierced in the center by an arched way from which access is had to the wings and to the central courtyard. The northern wing is occupied by the General Offices, Engineering, Design and Finishing Departments, while the southern wing is entirely occupied by the Chemistry and Dyeing Departments. In the basement is located an Industrial Chemistry Laboratory for the manufacture of dyes from the crude material, the Commerical Dyeing Laboratory and the Fuel and Oil Analysis Laboratory.

Kitson Hall makes a right angle with Southwick Hall and is 60 x 252 ft. with one story and a basement. It is occupied by the Cotton Yarn Department and heating, lighting, ventilating and power plant. The capacity of Kitson Hall was recently increased, permitting of an extension of the Finishing Department, a Mechanical Engineering Laboratory, a Machine Shop, Student's Athletic Rooms, Store Rooms, etc.

Falmouth Street building forms the third side of the quadrangle and consists of two portions, one 75 x 130 ft., two stories, and the head house 70 x 80 ft., three stories and basement. This building is occupied by the Departments of Weaving and Wool Yarns. The head house is occupied by these departments, and contains equipment for French Spinning, Warp Preparation, Wool Scouring, Carbonizing and Conditioning. The upper floor contains the Hand Loom Department.

The buildings are all faced with light brick with granite and Indiana lime stone trimmings and are of modern mill construction adapted to educational uses. The floor space of the School is



WOOLEN AND WORSTED DEPARTMENT

quadrupled in the new home, permitting of a very large increase in equipment and is now occupied by the several departments as follows :

Cotton Yarns and Knitting	12,000 sq. ft.
Woolen and Worsted Yarns	20,700 " "
Decorative Art and Textile Design	12,400 " "
General Chemistry and Dyeing Laboratories	14,000 " "
Commercial Dyeing	4,570 " "
Industrial Chemistry	1,572 " "
Finishing	7,000 " "
Power Weaving	15,600 " "
Mechanical and Electrical Engineering	13,600 " "

The additional floor space is devoted to Administration Offices, Library, Assembly Halls, Class Rooms, Store Rooms, Power Heating and Ventilating Plant, etc.

Southwick Hall was contributed by the Commonwealth of Massachusetts and Frederick Fanning Ayer, Esquire, of New York City, and is a memorial to Royal Southwick, a leading textile manufacturer, a public man of earlier days, and a maternal ancestor of Mr. Ayer.

Kitson Hall, dedicated to the memory of Richard Kitson, was contributed by Charlotte P. Kitson and Emma K. Stott, his daughters; the Kitson Machine Company of Lowell, founded by him, was also a generous contributor.

ADDITIONAL EQUIPMENT

Though from the first the management has kept in view the clearly defined objective which called for the establishment of the school, namely, the needs of the textile and kindred industries, it has developed its curriculum, its instruction methods, and equipment as those needs arose or became evident. At this writing its chemistry and dyeing, decorative art, design, yarn and weaving departments are equipped, and provided with able instructors for the highest efficiency. This year a very large addition to the applied mechanism, machine shop, and power production and application branches embraced by the title "Textile Engineering," has been made and the school becomes in fact a technical institute of wide repute both at home and abroad.



WOOLEN AND WORSTED YARN DEPARTMENT

While a large part of the following list of equipment has already been added, the remainder will be secured as soon as space and funds are available.

The list of equipment found later under the several departments includes some of the apparatus listed herewith.

Power Engineering Laboratory

Corliss condensing engine, Kerr steam turbine with electrical generator, gas engine, surface condenser, with connection for steam engine and turbine pumps, etc., absorption brake, gages, indicators, gas analysis apparatus, counters, planimeter, injectors, steam testing pump, anemometers, calorimeters, and a large variety of miscellaneous small apparatus.

Applied Mechanics Laboratory

Strength testing machine, 50,000 lbs., with accessories, transverse testing machine, torsion machine, cement and oil testing machines and accessories.

Hydraulics and Fire Protection

Motor driven fire pump, suction tank (cement) Pelton wheel, sprinkler tester, piezometer, meters.

Machine Shop

Engine lathes, speed lathes, drills, shaper, Universal milling machine, planer, tool grinder, motor, forges, pattern lathes, anvils, and a large variety of taps, dies, gages, reamers, and other small tools.

Electrical Laboratory

Direct current generators, shunt and series wound direct current motors, alternating current generators and motors, transformers, storage batteries, rotary transformers, switch board, testing instruments, galvanometers—Wheatstone, high resistance and slide wire bridges, photometer, and various accessories.

Physical Laboratory

Miscellaneous additions to present equipment for illustrating qualitatively and quantitatively the important principles of the branches of light, heat, sound, electricity and mechanics.

Fibre Laboratories

Varieties of machines for testing fibres, yarns and cloth.

Chemistry and Dyeing Laboratory

Oil and fuel testing apparatus and for extension of Industrial Chemistry laboratory equipment.

Gymnasium

Apparatus for instruction and exercise in physical culture has been installed in the upper hall of Southwick Hall, and additions to this apparatus will be made as requirements demand.



WOOLEN YARN DEPARTMENT

DAY CLASSES

These are especially intended for the instruction of those whose intention it is to enter the business of textile manufacturing in any branch. The courses are sufficiently complete to enable one to start without any previous acquaintance with textiles; but at the same time those who have been engaged in such business and wish to improve their knowledge and experience, can with profit pursue a course of study at the school.

The preparation for the successful pursuance of any of the courses should be such as will include a fundamental training in mathematics, science, English, history and either French or German. The usual four year scientific course of a good High School or Academy ought to be sufficient and proper preparation. For the detail requirements for entrance the reader is referred to Entrance Qualifications of Day Classes beginning on page 71.

Each course covers a period of three years, at the satisfactory completion of which the regular diploma of the school is awarded.

There is one term of preliminary instruction, which is common to all courses. At the end of this term, each student is required to select the course he is to follow in his subsequent studies, and the instruction given from this point is specialized to suit each course.

The five regular diploma courses are:

- I. Cotton Manufacturing.
- II. Wool Manufacturing.
- III. Textile Designing.
- IV. Chemistry and Dyeing.
- VI. Textile Engineering.

EVENING CLASSES

It is intended to give evening instruction to those who are engaged during the day in mills and work shops, to enable them to perfect their knowledge of the branches in which they work, to acquire knowledge of other processes than those in which they



WOOL SCOURING AND CARBONIZING

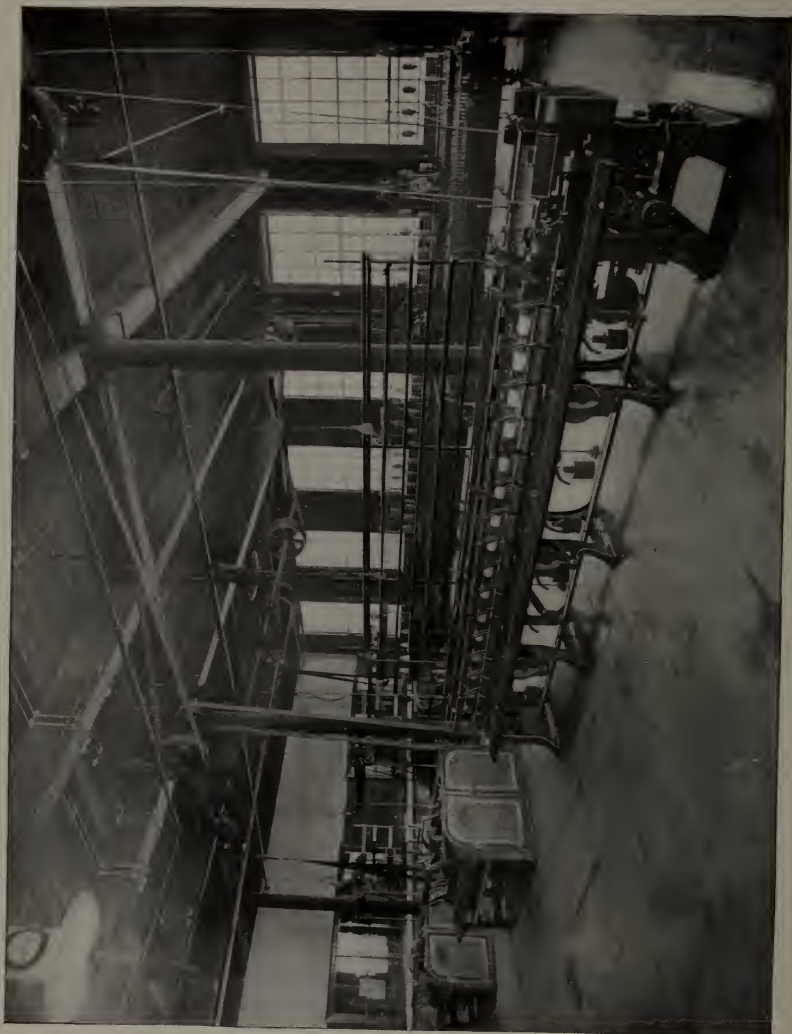
are regularly engaged, and to complete in the course of several winters, a thorough technical education without interfering with their daily duties.

The courses offered are similar to those of the day; but less time is devoted to the machine or laboratory work, since in most cases this is of small moment. Ordinarily the handling of the machinery is a part familiar to most of the students through contact with it in the day time, and in such cases the explanations and calculations are of the greater importance. In some cases it is possible to pursue two courses together, but this depends always on the arrangement of the schedule for any particular year.

All Evening Courses are free to residents of Lowell. All applicants must present satisfactory credentials showing that they are graduates of a Grammar School or school of higher standing, or they must pass entrance examinations in Arithmetic and English. For the first subject a short composition must be written on a given theme, and a certain amount must be written from dictation. In arithmetic the applicant must show suitable proficiency in addition, subtraction, multiplication, division, common and decimal fractions, percentage, ratio and proportion.

Courses are offered in:

- I. Cotton Spinning—2 years.
- II. (a) Woolen Spinning—2 years.
(b) Worsted Spinning—3 years.
- III. Designing—3 years.
- IV. Chemistry and Dyeing—4 years.
- V. (a) Cotton Weaving—1 year.
(b) Woolen and Worsted Weaving—1 year.
(c) Dobby and Jacquard Weaving—1 year.
- VI. Mechanics and Electricity—3 years.
Mechanical Drawing—3 years.
Architectural Drawing—3 years.
Freehand Drawing—3 years.
- VII. Woolen and Worsted Finishing—1 year.



FRENCH SPINNING DEPARTMENT

List of subjects embraced in each course is similar to that of the day and may be found beginning on page 94.

For the satisfactory completion of any of the above numbered courses, the certificate of the school will be awarded; the diploma of the school will be awarded in exchange for certificate of satisfactory completion of those subjects which go to make up any one of the regular diploma courses.

No diploma or certificate will be awarded until all dues to the school have been discharged.

Fee for each course for all except residents of Lowell, is \$5.00 per year payable in advance. All students, whether from Lowell or not, taking first or second year Chemistry and Dyeing Course, are required to make a deposit of \$5.00 at the commencement of the course. A deposit of \$10.00 will be required of all third and fourth year students taking this course. This is to cover the cost of laboratory breakages, and at the end of the year any unexpended balance is returned or an extra charge made for the excess breakage.

The schedule showing the arrangements of classes for each term will be announced at the opening of each term.

WOMEN'S DEPARTMENT

Among the many fields in which woman has entered, none has been found in which her natural refinement of taste and skill can be used to better advantage than in designing; but natural ability, though the prime requisite, is by no means all, for a certain amount of technical knowledge must be gained to achieve success. This department combines decorative art and textile design, and regular attendance is required as in other departments.



TEXTILE DESIGN DEPARTMENT

EQUIPMENT

The equipment of machinery, inventoried January 1, 1909, at \$210,915.96, is the most varied for textile educational purposes, and is being constantly augmented. The builders of the various machines installed keep in close touch with the school, adding to the machines such improvements as are made from time to time. This operates to mutual advantage of student and manufacturer.

COTTON DEPARTMENT

Ginning

- One 50 saw gin made by Daniel Pratt Gin Co., Prattville, Ala.
- One Prior Roller Gin.

Opening, Picking and Waste Machinery

An outfit of Kitson Picking Machinery from works of Kitson Machine Co., Lowell, Mass., including:

- One No. 7 Opener with Automatic Feeder connected by Robinson patent Cleaning Trunk to
- One 40 in. Single Beater Breaker Lapper with Condenser and gauge box feed.
- One 40 in. Single Beater Intermediate Finisher Lapper with Perham & Davis Sectional Plate Evener, apron to double four laps.
- One 40 in. Single Beater Finisher Lapper with Perham & Davis Sectional Plate Evener, apron to double four laps, Kirschner Patent Carding Beater.
- One Roving Waste Opener.
- One Thread Extractor.

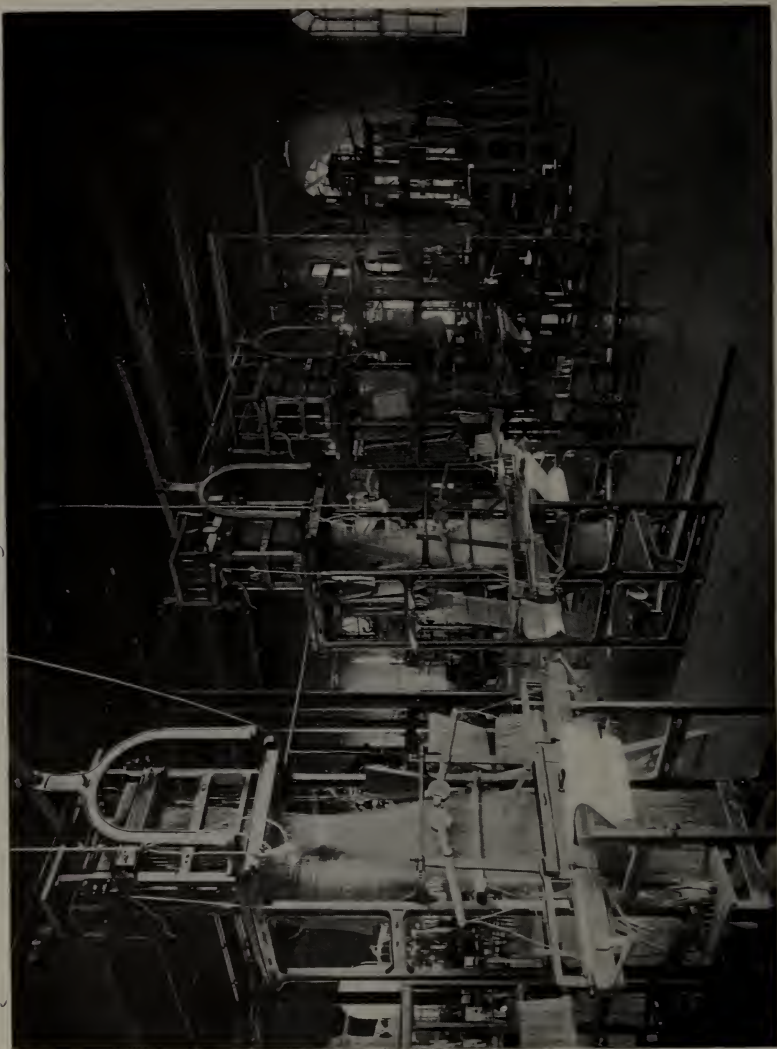
Carding, Combing and Drawing

The following machinery made by the Lowell Machine Shop, Lowell, Mass.

- One Top Flat Card.
- Three Revolving Flat Cards.
- Two Railway Heads.
- Two Drawing Frames.

One of the cards is equipped with the Chapman Electric Neutralizer made by Chapman Electric Neutralizer Co., Portland, Me.

From Kitson Machine Company
Stripping Rolls, etc.



SECTION OF THE HAND LOOM DEPARTMENT

From the Whitin Machine Works, Whitinsville, Mass.

One 40 in. Revolving Flat Card.

Card Grinding Rolls.

One Ribbon Lapper.

One Six Head Comber.

From the Mason Machine Works, Taunton, Mass.

One Sliver Lap Machine.

One Comb.

Roving, Spinning and Twisting

From Lowell Machine Shop, Lowell, Mass.

One Slubber.

One Intermediate.

One Fine Frame.

One Jack Frame.

Three Ring Spinning Frames.

One Spinning Mule.

One Spooler.

One Wet and Dry Twister.

From Whitin Machine Works, Whitinsville, Mass.

Two Ring Spinning Frames.

Miscellaneous Machinery of this Department includes:

From the Lowell Machine Shop, Lowell, Mass.

One Reel.

One Model Fine Fly Frame.

One Model Fly Frame Compound.

One Model Card Feed.

One Model Flat Grinding Device.

One Model Scroll Setting Device.

From The Universal Winding Co.

One Six head Universal Winder, for cones, tubes or multiple winding.

From George W. Payne Co., Pawtucket, R. I.

One 12 Spindle Cone Winder.

From Draper Co., Hopedale, Mass.

One Weeks Banding Machine.

Miscellaneous Machines.

One Yarn Inspection Machine with blackboards.

One Barbour Knotter.

Two Yarn Reels and Grain Scales.

One Power Yarn Tester.

One Twist Counter.



DECORATIVE ART DEPARTMENT

Knitting Department

- One Mayo "Acme" Full Automatic Seamless Knitting Machine from Mayo Knitting Machine and Needle Co., Franklin Falls, N. H.
- One Mayo "Acme" Full Automatic Knitting Machine with lace front attachment from Mayo Knitting Machine and Needle Company, Franklin, N. H.
- One Geo. D. Mayo Full Automatic Seamless Knitting Machine from Geo. D. Mayo Machine Co., Laconia, N. H.
- One George D. Mayo Full Automatic Knitting Machine with yarn changer and striper from Geo. D. Mayo Machine Co., Laconia, N. H.
- One Brinton Full Automatic Seamless Knitting Machine from H. Brinton Co., Philadelphia, Pa.
- One Brinton 200 Needle Ribber with clearing course attachment from H. Brinton Co., Philadelphia, Pa.
- One Brinton Rib Knitting Machine with Knee and Ankle Splicer and Plater from H. Brinton Co., Philadelphia, Pa.
- One McMichael and Wildman Rib Top Knitting Machine from Wildman Mfg. Co., Norristown, Pa.
- One Wildman Rib Knitting Machine, with Knee and Ankle Splicer and Automatic Stop Motion, Wildman Mfg. Co., Norristown, Pa.
- One Wildman Rib Top Machine with Automatic Stop Motion from Wildman Mfg. Co., Norristown, Pa.
- One Branson Stocking Machine from Branson Knitting Machine Co., Philadelphia, Pa.
- One Banner Knitting Machine with splicing and plating attachments from the Hemphill Mfg. Co., Pawtucket, R. I.
- One Crane 19 in. cylinder Flat Web Machine from Crane Mfg. Co., Lakeport, N. H.
- One Grosser, One Section Jacquard Machine from Grosser Knitting Machine Co., N. Y.
- One Grosser two thread looper for fine work from Grosser Knitting Machine Co., New York.
- One Lamb Sweater Machine from Lamb Knitting Machine Company, Chicopee Falls, Mass.
- One Lamb Glove Machine from Lamb Knitting Machine Company, Chicopee Falls, Mass.
- One Beattie Looper from Beattie Machine Works, Cohoes, N. Y.



POWER LOOMS

One Hepworth Looper with Trimming Attachment from J. W. Hepworth and Co., Philadelphia, Pa.

Five Sewing Machines, including two Shell Stitch Machines and three 2 and 3-thread Overseaming and Crocheting Machines, from Merrow Machine Co., Hartford, Conn.

Five Sewing Machines, including machines for Overseaming, Double Stitch Covering, Seaming and Welting, Vest Finishing, etc., from Union Special Sewing Machine Co., Boston, Mass.

WOOLEN AND WORSTED DEPARTMENT

Wool Sorting and Grading

This department is thoroughly equipped with benches, baskets, etc., for sorting wool in a convenient manner, and in addition there are samples of all grades and types of wool and other fibres.

Scouring and Carbonizing

Wool Scouring Machinery, C. G. Sargent's Sons Corp., Graniteville, Mass., consisting of

Cone Duster for Grease Wool.

Two Scouring Bowls, each 17 ft. x 24 in., with Parallel Rakes.

One Automatic Feeder for Scouring Bowls.

One Automatic Feeder for Dryer.

One Single Apron Dryer.

Carbonizing Screw Acid Tank.

Carbonizing Duster, with Crush Rolls.

From North Chelmsford Machine Co.

One Rinse Box.

From Schaum & Uhlinger.

One Hydro Extractor.

From C. S. Dodge, Lowell, Mass.

One Shoddy Picker.

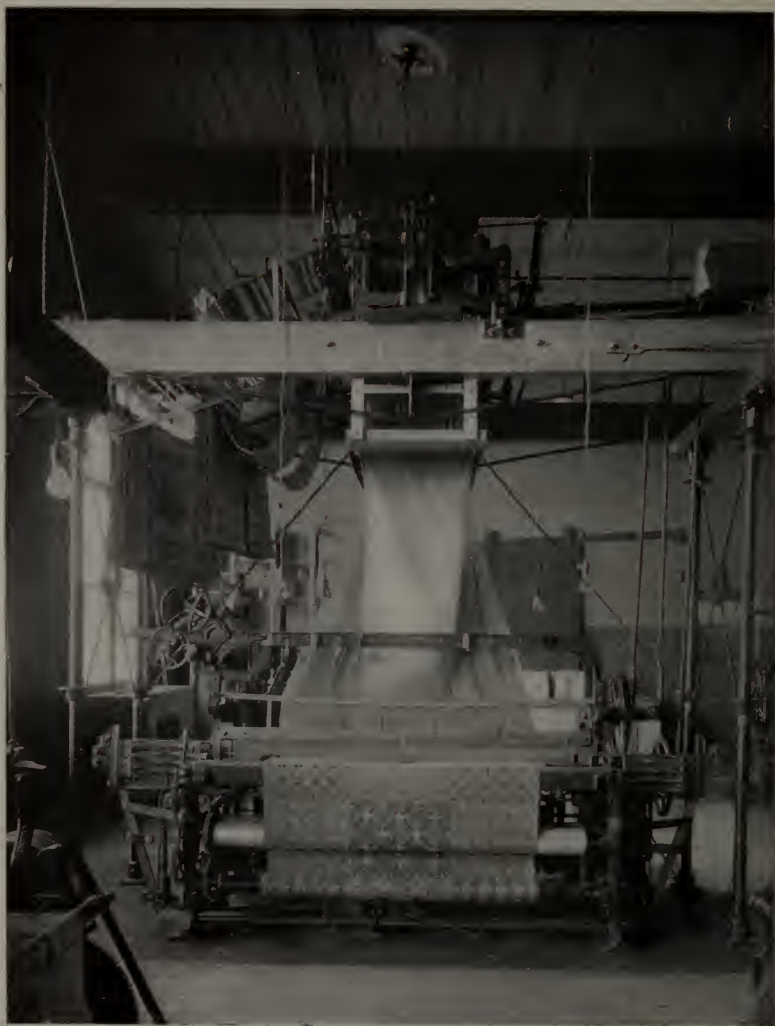
One Bagging Stand.

Woolen

Picking

One Parkhurst Burr Picker, Atlas Mfg. Co., Newark, N. J.

One Mixing Picker, Davis & Furber Machine Co., North Andover, Mass., equipped with Improved Mixing Picker Feed, and Spencer Oiler, both made by George S. Harwood & Son, Boston, Mass.



A TAPESTRY LOOM

Carding

One set of Woolen Cards, including :

First Breaker, Second Breaker and Finisher, Davis & Furber Machine Co., North Andover, Mass.; this set of cards equipped with Bramwell First Breaker Feed, George S. Harwood & Son, Boston, Mass.; Torrance Balling Head and Creel, (Torrance Mfg. Co., Harrison, N. J.) between First Breaker and Second Breaker; Apperly Feed, (George S. Harwood & Son, Boston, Mass.) between Second Breaker and Finisher, and Combination Rub Rolls and Apron Condenser, (Davis & Furber Machine Co., North Andover, Mass.), on Finisher. These cards are for medium or coarse work.

One set of Davis & Furber Woolen Cards including :

First Breaker, Second Breaker and Finisher. This set of cards equipped with Bramwell First Breaker Feed, (George S. Harwood & Son, Boston, Mass.); Apperly Feed with Kemp Traveler, (George S. Harwood & Son, Boston, Mass.), between First Breaker and Second Breaker; Bates Feed, (E. V. Bates, Lowell, Mass.), between Second Breaker and Finisher, and Davis & Furber Double Apron Condenser, on Finisher. These cards are for fine work.

Both sets of cards are equipped with the Chapman Electric Neutralizer made by Chapman Electric Neutralizer Co., Portland, Me.

One Sample Mixing Card, Torrance Mfg. Co., Harrison, N. J.

Spinning

One Spinning Mule, 120 spindles, Davis & Furber Machine Co., North Andover, Mass.; Bobbin Holders, supplied by American Bobbin Holder Co., W. Medway, Mass.

One Spinning Mule, 120 spindles, Johnson & Bassett, Worcester, Mass.; Bobbin Holders supplied by Murdock & Geb, Franklin, Mass.

One 1907 Fancy Yarn Twister, 20 spindles, Davis & Furber Machine Co., North Andover, Mass.

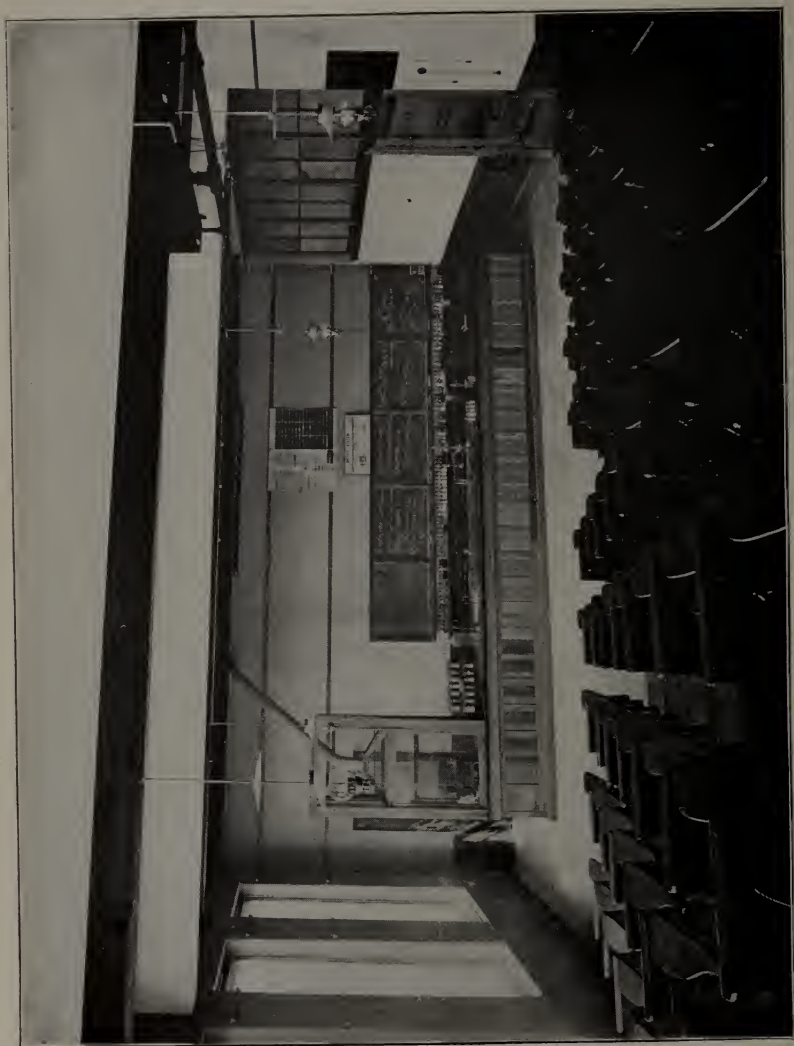
Card Grinding

One Roy Grinding Frame, B. S. Roy & Son, Worcester, Mass.

Two Roy Traverse Grinders, B. S. Roy & Son, Worcester, Mass.

One Entwistle Traverse Grinder, T. C. Entwistle Co., Lowell, Mass.

One Complete set of Carders' Tools, W. H. Brown, Worcester, Mass.



GENERAL CHEMISTRY LECTURE ROOM

Worsted

Carding

One 50-inch Double-cylinder Worsted Card (4 lickerin), Davis & Furber Machine Co., North Andover, Mass., equipped with Bramwell Feed, George S. Harwood & Son, Boston, Mass. Also equipped with a Chapman Electric Neutralizer, Chapman Electric Neutralizer Co., Portland, Me.

Backwashing

One Double Bowl, Five Cylinder Backwasher, with Gill Box, Taylor-Wadsworth & Co., Leeds, Eng., equipped with blueing motion, oiling motion, and Layland Patent pressure motion.

Gilling

One Doubling Balling Head Gill Box (with double screws), Lowell Machine Shop, Lowell, Mass.

One Weigh Gill Box and Creel, Lowell Machine Shop, Lowell, Mass.

Combing

One Baller, (punch), Crompton & Knowles, Worcester, Mass.

One Noble Worsted Comb, Crompton & Knowles, Worcester, Mass.

Gilling

One Finishing Can Gill Box, Hall & Stell, Keighley, England.

One Finishing Balling Head Gill Box, Hall & Stell, Keighley, Eng.

Bradford System of Drawing, Spinning and Twisting

The following Drawing, Spinning and Twisting Machinery, from Prince Smith & Son, Keighley, England.

One Revolving Creel for 12 Balls.	One Double Head Can Gill Box.
One 2 Spindle Drawing Box.	One 2 Spindle Gill Box.
One 2 Spindle Weigh Box.	One 12 Spindle Flyer Spinner.
One 4 Spindle First Finisher.	One 12 Spindle Ring Spinner.
One 12 Spindle Dandy Reducer.	One 12 Spindle 2 Fold Cap Twister.
One 12 Spindle Cap Spinner.	One 12 Spindle 6 Fold Ring Twister.

The following Drawing, Spinning and Twisting machinery from the Lowell Machine Shop, Lowell, Mass.

One 2 Spindle Drawing Box.	One 8 Spindle Cone Rover.
One 6 Spindle Second Finisher.	One 48 Spindle Cap Spinner, 4 ft. end
One 24 Spindle Dandy Rover.	One 48 Spindle Cap Spinner, 5 ft. end
One 6 Spindle Cone Reducer.	One 48 Spindle Boyd Ring Twister.

One Six Gang Universal Winder, equipped for cones or straight tubes, Universal Winding Co., Boston, Mass.

One Tape Band Sewing Machine, The Singer Mfg. Co., New York.



QUANTITATIVE LABORATORY

French System of Drawing and Spinning

The machinery made by the "Societe Alsacienne de Constructions Mechaniques" at Mulhouse, France, consists of the following:

FRENCH NAMES	ENGLISH NAMES
Gill Box (2 têtes)	Gill Box (2 heads)
Étirage à Frottoirs (2 têtes)	1st Drawing (2 heads)
Étirage à Frottoirs (2 têtes)	2nd Drawing (2 heads)
Étirage à Frottoirs (2 têtes)	3rd Drawing (2 heads)
Étirage-Réunion (4 Peignes)	Reducer (4 Porcupines)
Bobinier de Chûte (8 Peignes)	Slubber (8 Porcupines)
Bobinier (8 Peignes)	1st Intermediate (8 Porcupines)
Bobinier (8 Peignes)	2nd Intermediate (8 Porcupines)
Bobinier (8 Peignes)	Rover (8 Porcupines)
Finisseur (16 Peignes)	Finisher (16 Porcupines)
Selfacting à Filer (150 Broches)	Selfacting Mule (150 Spindles)

The apparatus in this department for obtaining and preserving the requisite condition of humidity consists of

Four Humidifiers of the American Moistening Co., Boston, Mass.

Six Steam Thompson Turbo Humidifier Heads, from The G. M. Parks Co., Fitchburg, Mass.

Yarn Weighing and Testing

From Lowell Scale Company:

One Large Platform Scale.

From Howe Scale Co.

One Dram Scale.

One Gramme Scale.

One Ounce Scale.

One Pound and Ounce Scale.

Two Yarn Reels.

One Roving Reel.

Three Grain Scales.

One Run Beam.

One Hand Yarn Strength Tester.

Two Twist Counters.

One Barbour Knotter.

DESIGN AND POWER WEAVING DEPARTMENT

Cotton Warp Preparation

One Spooler, Lowell Machine Shop, Lowell, Mass.

One Warper, Lowell Machine Shop, Lowell, Mass.



EXPERIMENTAL PRINTING LABORATORY

One Slasher, Lowell Machine Shop, Lowell, Mass.
 One Beamer, T. C. Entwistle Co., Lowell, Mass.
 One Winder, Altemus & Co., Philadelphia, Pa.
 One 400 End Improved Draper Warper, Draper Co., Hopedale, Mass.
 Drawing-in Frames, etc.
 One Pat. Slasher Press Roll, J. Battles & Co., Lawrence, Mass.
 One Pat. Expansion Comb for Warper, T. C. Entwistle Co., Lowell, Mass.
 One Quiller, Johnson & Bassett, Worcester, Mass.
 One Wet and Dry Twister, Draper Co., Hopedale, Mass.
 Set of six in. spools for Warper, Macrodi Fiber Co., Woonsocket, R. I.

Woolen and Worsted Warp Preparation

The equipment for this work includes a Jack Spooler, a Dresser, Reel, Beamer and a 48 Spool Creel all made by the Davis & Furber Machine Co., North Andover, Mass. There are also a number of hand warping and beaming frames.

Braiding Machinery

One 24 Line Hercules Braider.
 One 12 Line Braider.
 One Tubular Braider.
 One Sautach Braider.
 All made by the New England Butt Co., Providence, R. I.

Silk Preparing Machinery

One Winder, Atwood Machine Co., Stonington, Conn.
 One Ribbon Quiller, Atwood Machine Co., Stonington, Conn.
 One Warper and Beamer, Swiss Style, Atwood Machine Co., Stonington, Conn.
 One Double Frame, Atwood Machine Co., Stonington, Conn.

Plain Looms

One Plain Northrop Loom, Draper Co., Hopedale, Mass.
 One Plain Print Cloth Loom, Whitin Machine Works, Whitinsville, Mass. To this is attached a Kip-Armstrong Warp Electric Stop Motion.
 One Plain Print Cloth Loom, Mason Machine Works, Taunton, Mass.
 One Kilburn & Lincoln Plain Loom.
 Eight Lowell Machine Shop Plain Looms.
 One English Loom, Hattersley.
 One Improved Northrop Loom, fine sateen, Draper Company, Hopedale, Mass.



VIEWS IN INDUSTRIAL CHEMISTRY LABORATORY

One Northrop Loom with dobby, Draper Co., Hopedale, Mass.
 One Side Cam Twill Loom, Whitin Machine Works, Whitinsville, Mass.
 One Five Harness Sateen Loom, Lowell Machine Shop, Lowell, Mass.
 One Harriman Automatic Shuttle Changing Loom.
 One Lewiston Machine Co. Loom, 4 harness, side cam.
 One Crompton Jean Loom.

Fancy Looms

One Lewiston Machine Co. Bag Loom.
 One Knowles Gingham Loom, 4 boxes, Crompton-Knowles Loom Works.
 One Crompton Gingham Loom, 4 x 1 boxes, Crompton-Knowles Loom Works.
 One Crompton Towel Loom, 2 x 1 boxes, Crompton-Knowles Loom Works.
 One Crompton Lappet Loom, with 16 harness dobby, Crompton-Knowles Loom Works.
 One Knowles Fancy Cotton Loom, 20 harness dobby, 4 boxes, for fancy leno work, Crompton-Knowles Loom Works.
 One Knowles Fancy Cotton Loom, 25 harness dobby, Crompton-Knowles Loom Works.
 One Crompton Fancy Cotton Loom, single cylinder, 20 harness dobby, Crompton-Knowles Loom Works.
 One Knowles Gem Loom, 20 harness, 4 x 4 boxes, Crompton-Knowles Loom Works.
 One Crompton Worsted Loom, 24 harness, 4 x 4 boxes, Crompton-Knowles Loom Works.
 One Crompton Fancy Loom, 6 x 1 double cylinder, 20 harness dobby, Crompton-Knowles Loom Works.
 One Twenty Harness Dobby Loom, Whitin Machine Works, Whitinsville, Mass.
 One Crompton & Knowles Heavy Loom, 20 harness, 4 x 4 boxes, Crompton-Knowles Loom Works.
 One Knowles Blanket Loom, 25 harness dobby, 4 boxes, Crompton-Knowles Loom Works.
 One Knowles Worsted Loom, 32 harness, 4 x 4 boxes, Crompton-Knowles Loom Works.
 Three Knowles Heavy Woolen Looms, 25 harness, 4 x 4 boxes, Crompton-Knowles Loom Works.
 One Model Dobby Attachment.



VIEW IN COMMERCIAL DYEING LABORATORY

Jacquard Looms

- One 400 hook Schaum and Uhlinger Jacquard Machine.
- One Knowles Fancy Loom, single lift Jacquard, Crompton-Knowles Loom Works.
- One Knowles Fancy Loom, double lift Jacquard, Crompton-Knowles Loom Works.
- One Knowles Fancy Loom, Jacquard tied up for leno, Crompton-Knowles Loom Works.
- One Knowles Ingrain Carpet Loom, 4 x 4 boxes, Crompton-Knowles Loom Works.
- One Crompton Ingrain Carpet Loom, 4 x 4 boxes, Crompton-Knowles Loom Works.
- One Stafford Silk Loom, 1200 hook Halton Jacquard, Crompton-Knowles Loom Works.
- One Crompton & Knowles 72 in. Tapestry Loom, 2600 hook Tapestry Jacquard Head, Crompton-Knowles Loom Works.
- One 800 hook Knowles Gem Silk Brocade Jacquard Machine, single lift 4 x 4 boxes, Crompton-Knowles Loom Works.
- One 800 hook single lift, Knowles 4 bank ribbon Jacquard Loom, Crompton-Knowles Loom Works.

Card Cutting Machines

- One Jacquard Fine Index Card Cutting Machine, John Royle & Sons, Paterson, N. J.
- One Jacquard French Index Card Cutting Machine, John Royle & Sons, Paterson, N. J.

Hand Loom Weaving

- Twelve Hand Looms, 3 x 3 boxes, 20 harness dobby.
- Eight Hand Looms, 4 x 4 boxes, 24 harness dobby.
- Eight Hand Looms, 3 x 3 boxes, 32 harness dobby.
- Six Hand Looms, 4 x 4 boxes, 30 harness dobby.
- Two Hand Looms, 4 x 4 boxes, 32 harness dobby.
- Two Hand Looms, 4 x 4 boxes, 200 hook Jacquard.
- Two Hand Looms, 3 x 3 boxes, 200 hook Jacquard.
- Two Hand Looms, 3 x 3 boxes, 600 hook Jacquard.
- One Hand Loom, 48 harness.
- Two Hand Looms with treadles.
- Pattern Warping Stands.
- Beaming, drawing-in stands, etc.



EXPERIMENTAL DYEING LABORATORY

CHEMISTRY AND DYEING DEPARTMENT

Chemical Laboratories

The General Chemistry and Qualitative Analysis Laboratory includes :

One hundred and twenty laboratory desks, each containing a full set of apparatus for the first year's work in chemistry; also gas and water fittings, reagents and sinks.

Four Large Double Hoods.

Two Steam Baths.

One Parson's Automatic Gas Generator.

Quantitative Laboratory

One Water Distilling Apparatus.

One Steam Drying Closet and Several Drying Ovens.

One Large Steam Bath.

One Electrolytic Table.

Five Hoods.

Thirty-six laboratory desks, each fully provided with apparatus.

Balance Room

One Large Christian Becker Analytical Balance.

Six Small Christian Becker Analytical Balances.

One Standing Analytical Balance.

One Eimer & Amend Analytical Balance.

One H. L. Becker's Son & Co. Analytical Balance.

Combustion Room

One Combustion Furnace, 25 burners.

One Lothar Meyer's Furnace for tubes.

One Kerosene Burner Muffle Furnace.

Microscopic and Colorimetric Laboratory

Two Benches for microscopical work.

Three Bausch & Lomb Compound Microscopes.

One Nachet et Fils Compound Microscope.

One Tintometer.

Desk and shelves for the apparatus and reagents necessary for this branch of the work.

Adjoining this laboratory is a dark room for Spectrum Analysis, Photometric Work, etc.



FINISHING DEPARTMENT

Assistant Instructors' Laboratory

- One Large Case of chemicals.
- One Double Hood.
- One Copper Water Bath.
- One Soapstone Sink with a drain board.
- Benches, desks and complete fittings for water, gas and suction.

Private Laboratory

- One Christian Becker Balance.
- One large B. & L. Microscope.
- One Parr Calorimeter.
- One Case for Chemicals and Apparatus.
- Three Laboratory Benches, with necessary fittings.
- One Large Hood.
- One Steam Bath.
- One Experimental Dye Apparatus.
- One Porcelain Sink and Drain Board.

Chemical Lecture Room

Is provided with a lecture table fully equipped with gas, water, sinks, a hood and sufficient apparatus for lecture experiments.

An electric arc reflectroscope provided with suitable screen, which makes it possible to illustrate a lecture either from slides or by cuts, photographs or objects.

Seats are provided for 80 students, and are arranged on a raised floor so that every student has a full view of the lecture table.

This room contains various collections of dye stuffs and chemicals for exhibition and for lecture demonstration.

Experimental Dyeing Laboratory

The dyeing laboratory is equipped with individual benches, small dyeing apparatus, reels, balances, apparatus for dye testing, such as frames for exposing dyed material to light, and a complete collection of dyestuff samples and sample cards.

- One Small Hydro-Extractor, from W. H. Tolhurst & Son, Troy, N. Y.
- Twenty-four Steam Jacketed Experimental Dyeing Machines.
- One Drying Chamber.
- One Ageing Chamber.

Experimental Printing Laboratory

- One Calico Printing Machine, made by Mather & Plant, Oldham, England.
- One Iron Jacketed Steaming Chamber from A. Edmeston & Son, Salford, England.
- One set of Steam Jacketed Copper Kettles.



FINISHING DEPARTMENT

Fuel and Oil Analysis Laboratory

Mahler Bomb Calorimeter, with complete outfit.
Emerson Bomb Calorimeter, with complete outfit.
Parr Calorimeter.
Abbe Refractometer.
Torsion Viscosimeter.
Pensky Martin Oil Tester.
N. Y. State Oil Tester.
Sartorius Specific Gravity Balance.
Becker Analytical Balance.
Gas Muffle Furnace.
Kny Scherer Oil Tester.
Graefe Gas Calorimeter.
Orsat Gas Analysis Apparatus.
Laboratory Tables, Lockers and Hoods.

Industrial Chemistry Laboratory

One Filter Press, Type E, T. Shriver and Co.
One Single Acting Triplex Plunger Pump, Gould's Mfg. Co.
One Vacuum Drying Apparatus, Norman Hubbard's Sons.
One Surface Condenser, Norman Hubbard's Sons.
One Packard Vacuum Pump, Norman Hubbard's Sons.
One Vacuum Evaporator, Swenson System, American Foundry and Machine Co.
One Centrifugal, C. H. Chavant and Co.
One Double Jar Mill, F. I. Stokes and Co.
One Sturtevant Ore Crusher.
One Sturtevant Pulverizer.
Ten Copper Steam Baths, D. H. Wilson and Co.
One 36 in. Ventilating Fan, Mass. Fan Co.
One Autoclave.
Twenty-four Lockers.
Two Concrete Top Tables.

Commercial Dyeing Laboratory

One Kier, Atlantic Works, East Boston, Mass.
One small Kier, fitted with E. D. Jefferson's circulating device.
One Electrolyzer for manufacturing bleaching solutions, The National Laundry Machinery Co., Dayton, Ohio.
One 4 String Dyeing Machine, Rodney Hunt Machine Co., Orange, Mass.
One Mercerizing Machine.
One Raw Stock Dyeing Machine, Klauder-Weldon Dyeing Machine Co., Amsterdam, N. Y.



CLOTH OF STUDENTS' MANUFACTURE

One Yarn Dyeing Machine, Klauder-Weldon Dyeing Machine Co.,
 Amsterdam, N. Y.
 One Jig Dyeing Machine, The Textile-Finishing Machinery Company,
 Providence, R. I.
 One set of Drying Cans, The Textile-Finishing Machinery Company,
 Providence, R. I.
 One Chain Dyeing Machine, T. C. Entwistle Co., Lowell, Mass.
 One Raw Stock Drying Table, Philadelphia Textile Machinery Co.,
 Philadelphia, Pa.
 One Padding Machine, Arlington Machine Works, Arlington, Mass.
 One Hydro-Extractor, W. H. Tolhurst & Son, Troy, N. Y.
 Seven Dye Tubs.
 One Power Yarn Reel.
 One Reeves' Variable Speed Device.
 Two Trucks.

FINISHING DEPARTMENT

One 2 string Washer, Rodney Hunt Co., Orange, Mass.
 One Fulling Mill, Rodney Hunt Co., Orange, Mass.
 One Up and Down Dry Gig, Curtis & Marble, Worcester, Mass.
 One Rolling and Stretching Machine, Curtis & Marble, Worcester,
 Mass.
 One Up and Down Wet Gig, Curtis & Marble, Worcester, Mass.
 One Steam Finishing Machine, Curtis & Marble, Worcester, Mass.
 One 60 in. 3 burner Singeing Machine, adapted for Cotton, Silk or
 Worsted Goods, Curtis & Marble, Worcester, Mass.
 One Two Cylinder Double Acting Brushing Machine, Curtis & Mar-
 ble, Worcester, Mass.
 One 60 in., 4 Cylinder Sanding and Polishing Machine, Curtis and
 Marble, Worcester, Mass.
 One Kicking Mill, James Hunter & Co., North Adams, Mass.
 One 6-4 Double Shear, Parks & Woolson, Springfield, Vt.
 One 6-4 Voelker Rotary Press, G. W. Voelker & Company, Woon-
 socket, R. I.
 One Tentering and Drying Machine, John Heathcote, Providence, R. I.
 One Single Crabbing Machine, H. W. Butterworth & Son, Philadel-
 phia, Pa.
 One 72 in., Woolen Napper, Davis & Furber, North Andover, Mass.
 One 32 in., Basket Hydro-Extractor, W. H. Tolhurst & Son, Troy,
 N. Y.
 One A. W. C. Measuring and Weighing Machine, Parks & Woolson,
 Springfield, Vt.
 One Lintz and Eckhardt Cloth Numbering Machine, imported by
 Durbrow & Hearne Mfg. Co., New York.



MECHANICAL DRAWING ROOM

One Steam Press for Underwear, United States Hoffman Co., Syracuse, N. Y.

One Sewing Machine, Birch Brothers, Somerville, Mass.

Soap tanks, perch, burling and measuring tables.

ENGINEERING DEPARTMENT

PHYSICAL LABORATORY

Through the generosity of a friend of the School a laboratory has been provided with the most approved apparatus for testing the physical properties of all fibres, yarns, and fabrics; the equipment includes:

One Bausch and Lomb D. D. Microscope.

Two inch, 1 inch, and 1-2 inch regular eyepieces.

Three-fourths inch (photographic), 2-3 inch, 1-6 inch, 1-12 inch (oil immersion) objectives.

One Eye Piece Micrometer.

One Filar Micrometer, (1 inch equivalent eyepiece) for refined diameter determinations.

One Standard Glass Stage, divided to 1-10 and 1-100 m. m. with corrections as tested against the International m. m.

Complete outfit for mounting shades.

Complete outfit for photo micrography.

Camera Lucida.

Microtome Sectioning Outfit.

One Small Skein Testing Machine.

One set Conditioning Ovens for moisture determination.

One Yarn Testing Machine, adjusted to test strength, twist, take up, elasticity, and stretch.

One Hydraulic Cloth Strength Testing Machine.

One Brown & Sharpe Metre Reel.

Miscellaneous apparatus for experiments in Mechanics, Heat, Light, Sound and Electricity.

The proper conditions of humidity in this laboratory are obtained and maintained by one Thompson Air Turbo Humidifier Head, made and installed by The G. M. Parks Mfg. Co., Fitchburg, Mass, and also by one Humidifier Head made by Schutte & Koerting Co., Philadelphia, Pa.

ENGINEERING LABORATORY

The engineering laboratory contains the following equipment:

- 50 H. P. Allis-Chalmers Corliss steam engine (Reliance type) for experimental purposes arranged to operate condensing or non-condensing and direct connected to an Alden absorption dynamometer.



ENGINEERING LABORATORY

Wheeler Surface Condenser (200 sq. ft. surface) with 5 in. x 6 in. x 6 in. x 7 in. combined air and circulating pump.

25 K. W. Kerr steam turbine (7 stage) direct connected to 25 K. W. Richmond Electric alternating current generator and arranged for both condensing and non-condensing conditions. The generator is especially designed for experimental work with connections and windings for all the commercial phases.

5000 gallon pressure tank for heads up to 300 ft. and connections for experimental work.

Two 2500 gallon concrete storage tanks.

Complete set of weighing and suction tanks on Fairbanks Standard scales.

Deane Triplex power pump, 4 in. x 6 in.

Clayton air compressor (belted type) 6 in. x 6 in.

Centrifugal pump, 2 inch (belted type), Lawrence Machine Company, Lawrence, Mass.

Two Sturtevant fan blowers for experimental work.

Metropolitan injector.

Differential transmission dynamometer.

Variable speed transmission.

Accessory apparatus such as steam and gas engine indicators, planimeters, calorimeters, tachometers, gages, gage testers, barometers, thermometers, etc. Apparatus for gas analysis is also available and the chemical department is fully equipped for calorific determinations of fuels.

All steam supplied to the laboratory passes through a 4 inch horizontal Cochrane steam separator to insure dry steam for experimental work.

Buff & Buff Engineers Transit Philadelphia level rod.

Apparatus for testing friction and slip of belts and pulleys.

Standard Westinghouse A. C. generator, switchboard panel with special instruments and connections for 25 K. W. turbo-generator in 2-phase, 3-phase or single phase.

Westinghouse portable polyphase A. C. wattmeter with series transformers.

Two General Electric A. C. Ammeters.

One General Electric A. C. Voltmeter.

General Electric 3 H. P. induction motor.

Allis-Chalmers 10 H. P. direct current motor.

One 4 H. P. G. E. Electric Dynamometer which may be used as a double current generator or rotary transformer receiving direct current at 220 volts and delivering three phase alternating current which by a step-up transformer will give 220 volts at 60 cycles.

One 250 volt Weston Portable Voltmeter.

One 250 volt Weston Portable Voltmeter with calibrating coil.

One 150 ampere Weston Portable Anmmeter.



MACHINE SHOP

- One Weston Portable Millivoltmeter with 200 milli-volt and 20 milli-volt scales.
- One 2 ampere and one 20 ampere shunt for use with above instrument as an ammeter.
- One D'Arsonval Reflecting Galvanometer.
- One Simple Galvanometer.
- One Wheatstone Bridge.
- Two Direct Current Self Feeding Arc Lamps.
- Two Hand Feed Arc Lamps for stereopticons.
- Resistance boxes of various sizes and other apparatus necessary for commercial testing of lamps, motors, etc.
- An Exhibition Board containing samples of the Chloride and Exide Storage Battery Plates donated by the Electric Storage Battery Co. of Philadelphia.

Machine Shop

The equipment of the machine shop is as follows:

- One standard engine lathe, 13 inch swing, 6 foot bed, from Flather & Co., Nashua, N. H.
- One new model quick change engine lathe, 14 in. swing, 6 foot bed, from Flather & Co., Nashua, N. H.
- One standard engine lathe, 18 in. swing, 10 foot bed, with taper attachment, from Flather & Co., Nashua, N. H.
- Two speed lathes, 11 in. swing, 5 foot bed, from J. G. Blount, Everett, Mass.
- One 23 inch upright drill, with back gears and power feed, from J. E. Snyder & Son, Worcester, Mass.
- One 14 inch single spindle sensitive drill, from the Stanley Mfg. Co., Lawrence, Mass.
- One 24 in. x 24 in. x 6 ft. planer, from the Mark Flather Planer Co., Nashua, N. H.
- One No. 1, Universal Milling Machine with all three feeds automatic, from the Kempsmith Mfg. Co., Milwaukee, Wis.
- One 20 inch wet tool grinder, from J. G. Blount, Everett, Mass.
- One 12 inch, two wheel, dry grinder, from J. G. Blount, Everett, Mass.
- One 30 inch grindstone and frame, from the Athol Machine Company, Athol, Mass.
- One single spindle centering machine, from the D. E. Whiton Machine Co., New London, Conn.
- One power hack saw, from the Fairbanks Co., Boston, Mass.

These tools are fully equipped with chucks, centres, tools, etc., for a great variety of work. Benches with vises are also provided for such work as chipping, filing, etc.

A thoroughly equipped tool room contains an ample stock of the best makes of small tools such as drills, taps and dies, milling cutters, reamers, gauges, micrometers, etc.



MECHANICAL ENGINEERING CLASS ROOM

The following wood working tools are also provided in addition to benches for pattern making:

One pattern maker's lathe, 16 in. swing, 8 foot bed, from Fay & Scott, Dexter, Me.

One 32 in. band saw, from the Crescent Machine Co., Leetonia, O.

One iron single saw bench, from the Crescent Machine Company, Leetonia, O.

Two blacksmith forges, anvils and tools are also provided, and a gas oven for hardening and tempering tools.

POWER, LIGHT, HEAT AND VENTILATING PLANT

One 300 H. P. Aultman and Taylor Horizontal Water Tube Boiler, equipped with U. S. Rocking Grates.

Two 100 H. P. Stirling Water Tube Boilers.

These boilers are connected to a Sturtevant Induced Draft Apparatus, including fan, direct connected to the Sturtevant vertical engine and equipped with two way dampers. One of the Stirling Boilers is so piped that it may be cut off from the regular plant in order to supply the Engineering Laboratory only.

One Sturtevant Smoke Filtering Apparatus.

One Locke Steam Pressure Regulator for draft engine.

One Knowles Boiler Feed Pump, 6 in. x 4 in. x 6 in.

One Warren Webster Feed Water Heater, Filter and Oil Extractor.

One Payne 14 in. x 14 in. Automatic High Speed Engine of 125 H. P.

One 9 1-2 in. x 11 3-4 in. Nash Gas Engine of 50 H. P. of the four cycle type, with speed regulating clutch and hit and miss governor.

One Motor Driven Air Compressor 5 1-2 in. x 6 in. with a storage tank of 20 cubic feet capacity, 100 lbs. per sq. in. pressure.

One Complete Sturtevant Double Duct System for heating Southwick Hall. This apparatus is designed to provide the proper amount of fresh warm air called for by the State law as applied to educational institutions, and includes a 9 ft. x 4 ft. fan direct connected to the Sturtevant horizontal engine, drip tank and Knowles automatic return pump, 4 1-2 in. x 2 3-4 in. x 4 in. arranged to deliver either to the feed water heater or to the boilers direct.

Complete Ventilation System for Southwick Hall and Falmouth Street Building including 6 direct connected motor driven exhaust fans.

One Sturtevant Fan and Heater for Kitson Hall and Falmouth Street Building, direct connected to a Sturtevant inverted engine.

One Cross Oil Filter.

One Complete Moistening Apparatus installed by the American Moistening Co., Boston, Mass., including Knowles triplex 4 x 4 power pump, tank, and 20 moistening heads.

One Moistening Apparatus with Thompson's Turbo Heads, installed in French Spinning Department, by the G. M. Parks Co., Fitchburg, Mass.



KITSON HALL

ATHLETIC FIELD

SOUTHWICK HALL

One Complete Sprinkler System for fire protection, using the Grinnell glass button heads.

One Bullock 75 K. W. Direct Current Multipolar Compound Generator, wound for 220 volts, over compounded 20 volts from no load to full load. This is direct connected to the Payne engine.

One Bullock 30 K. W. Generator of the same type, direct connected to the Nash gas engine.

The switchboard is arranged so that either unit may be thrown in independently on the power or lighting feeders or the two machines may be run in parallel. The lighting circuits are on the two wire 220 volt system and supply the equivalent of 1030—16 candle power lamps. The power circuits are on the same system and supply approximately 170 H. P. in motors.

Three 24 H. P. Bullock Motors.

One 20 H. P. General Electric Motor.

Two 10 H. P. Allis Chalmers Motors.

Two 7 1-2 H. P. General Electric Motors.

Four 15 H. P. Bullock Motors.

One 3 H. P. Motor, New England Motor Co.

One 2 H. P. Motor, Holtzer-Cabot Electric Co.

ATHLETICS

Through the generosity of Mr. Frederick Fanning Ayer, the school has been provided with a Campus and Athletic Field of about three acres. This has been carefully graded and laid out for base ball, foot ball and track athletics. Bleachers have been provided which are used for either the out-of-door games or for basket ball played in a hall specially equipped for this game.

In the basement of Kitson Hall there has been provided a recreation room for the use of the students at such times as their attendance is not required in classes. This room is also used by those who take part in athletics, and connected to it is a smaller room provided with shower baths, lockers and toilets. Both rooms are easily accessible to the Campus by way of the outer door of Kitson Hall.

This year a beginning has been made in the equipping of the upper hall of Southwick Hall with gymnastic apparatus. This includes several sets of chest weights; 2 dozen wooden dumb bells; 3 dozen Indian clubs; a set of travelling rings; a vaulting horse; parallel bars; a punching bag and several sets of foils and single sticks. It is expected that this equipment will be increased as the demand for its use is felt and funds become available.

The athletic interest is growing yearly and receives the encouragement of the management.



MACHINE SHOP

DAY CLASSES

Entrance Qualifications

Candidates for admission are accepted upon presentation of properly vouched certificates showing the completion of a regular four year course at a High School or Academy of reputable standing. The certificate must specify that the applicant has satisfactorily passed the subjects hereafter listed for entrance examinations. For all others, there are held examinations, as stated in calendar; candidates failing to pass at June examinations are allowed to try again in September; those who cannot attend the June examinations, may present themselves in September.

The Calendar of examinations is as follows:

Monday, June 21, 1909; September 13, 1909; and June 20, 1910:

Algebra	9 to 11 A. M.
Geography	11 A. M. to 1 P. M.
English	2 to 4 P. M.

Tuesday, June 22, 1909; September 14, 1909; and June 21, 1910:

Geometry	9 to 11 A. M.
History	11 A. M. to 1 P. M.
Arithmetic	2 to 4 P. M.

Algebra

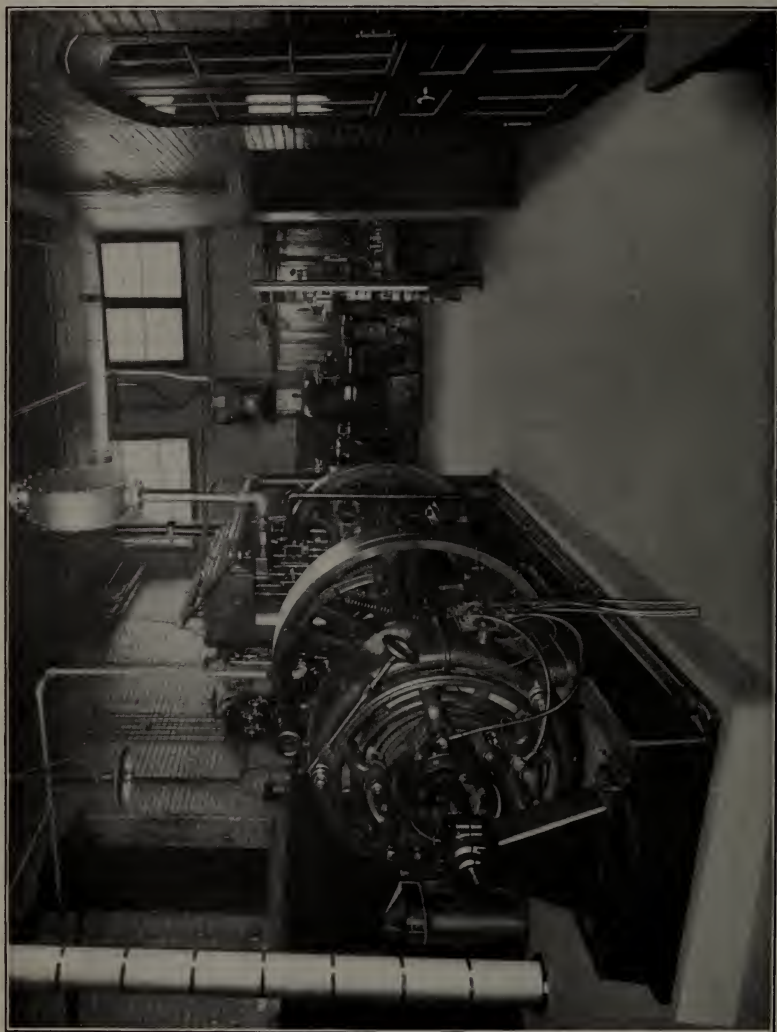
Fundamental operations, parenthesis; factoring; highest common factor; least common multiple; fractions, simple and complex; simple equations, one or more unknown quantities; radicals; involution and evolution; square and cube root; logarithms; ratio and proportion; exponents, including fractional and negative.

Plane Geometry

As much plane geometry as is included in any of the generally accepted text books. The student should be familiar with properties of plane rectilinear figures, the measurement of angles, the circle, polygons, etc. He should be able to make applications to the measurement of lines and plane figures.

Arithmetic

Definitions; elementary, operations in addition, subtraction, multiplication and division; squares; cubes; square root; interest, discount; fractions, simple and complex; decimals; percentage, alligation; ratio and proportion. Metric System.



GAS ENGINE UNIT — ENGINE ROOM

English

The applicant must have such knowledge of the following books as will enable him to discuss intelligently their subject matter, literary form and structure. He will also be expected to be familiar with the lives of the authors, and with the important historical events associated with the books.

The books for June and September, 1909, are: Shakespeare's *The Merchant of Venice*; Sir Roger de Coverley Papers in the *Spectator*; Irving's *Life of Goldsmith*; Coleridge's *The Ancient Mariner*; Scott's *Ivanhoe* and Lowell's *The Vision of Sir Launfal*; George Eliot's *Silas Marner*; Burke's *Speech on Conciliation with America*.

For June and September, 1910: Shakespeare's *Macbeth*; Sir Roger de Coverley Papers in the *Spectator*; Coleridge's *The Ancient Mariner*; Scott's *Ivanhoe*; Macaulay's *Essay on Addison*; Tennyson's *Lancelot and Elaine*, and *The Passing of Arthur*; Burke's *Speech on Conciliation with America*; Franklin's *Autobiography*; George Eliot's *Silas Marner*.

The applicant will be required to write two or three short themes on subjects taken from the above mentioned books. The examination in English, however, will test, primarily, the ability of the applicant to express himself with clearness and accuracy. In all cases, knowledge of the books will be considered of less importance than the ability to write clear and correct English. Evidence of serious weakness in spelling, punctuation, grammar and division into paragraphs will be considered sufficient ground for rating such work as a failure. The applicant may be required to correct examples of bad grammar and punctuation.

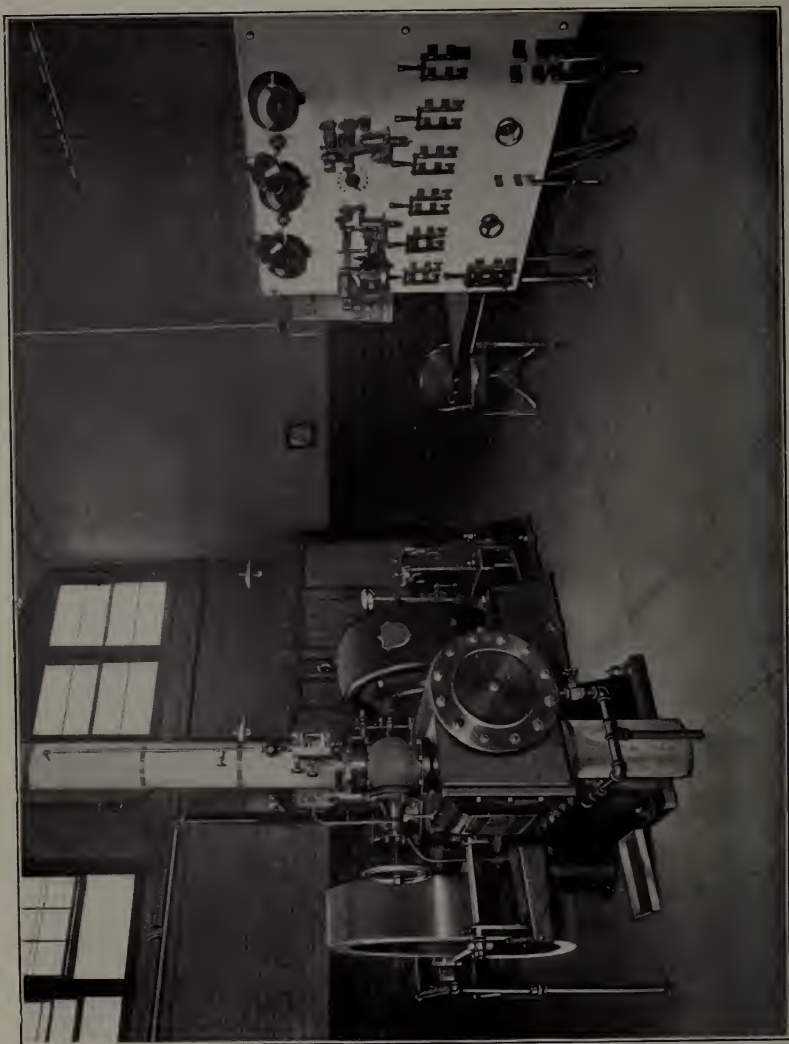
English written in any other admission examination may, if necessary, be considered by the examiner as part of the examination in English.

Geography

Location of principal countries, with capitals, large rivers, mountains, etc., noting characteristics of climate, productions and inhabitants. General statements rather than specialization are sought.

American History

Applicants must show familiarity with the early settlements in America, the colonies, their government, the customs of the people and events which led to the establishment of the United States. They should be informed concerning the causes and effects of the principal wars in which the country has been involved. Applicants should be prepared to consider questions involving a knowledge of Civil Government as well as historical facts, connected with the growth of this country up to the present time.



STEAM ENGINE UNIT — ENGINE ROOM

Preparation

Particular stress is laid upon a thorough grounding in mathematics including Algebra, Arithmetic and Plane Geometry, as these form the basis upon which the work of this school rests. A preliminary course in science, including Physics and Chemistry serves to prepare the student's mind for the higher branches of these subjects and their application.

Advanced Standing

Candidates who may have received previous training in any of the subjects ordinarily taken in the regular course may present themselves for examination as per calendar. If a satisfactory rank be attained, they will be given such further work as will be best suited to their advancement.

Attendance Card

At the beginning of each term all students must fill out and file with the Principal on blank forms which are provided, a formal application for such subjects as are required in his course and for which he is sufficiently prepared, subject to the approval of the Principal. When an attendance card is once approved, no change can be made except through the Principal.

Application Blanks

A blank form of application for admission may be found at the end of this bulletin. This should be properly filled out by all applicants whether entering upon certificate from a preparatory school or presenting themselves for examinations.

Fees

The fee for the day course is \$100 per year for residents of Massachusetts, with the exception of the Chemistry and Dyeing Course, for which the fee is \$125 for 2nd and 3rd year students. For First Year students taking the Chemistry and Dyeing Course the first term fee is \$60 and the second term fee \$52.50. This applies only to students entering in September, 1907 and thereafter. For non-residents the fee for all courses is \$150 per year.

Fee for students from foreign countries is \$300 per year for those entering in September, 1908, and thereafter.

Three-fifths of the fee is charged for a single term and is payable on or before October 10, the balance on or before February 10, of each year.



BOILER ROOM

Students attending but one term will be charged three-fifths of the yearly fee. After payment is made, no fee or part thereof can be returned, except by special action of the Trustees.

Special students pay, in general, the full fee, but if a course be taken involving attendance at the school during a limited time, application may be made to the Principal for a reduction.

Students must provide their own books, stationery, tools, etc., and pay for any breakage or damage that they cause. The above fee includes free admission for any day student desiring to attend any of the evening classes in which there is accommodation.

For all first year students a minimum deposit of \$20 is required to cover the cost of breakage in the chemical laboratory, the unexpended balance to be returned to the student at the end of the year.

For all students in second or third year taking work in Chemistry or Dyeing Laboratories a deposit of \$15 per term is required. The unexpended balance will be returned at end of year.

The fees for the evening classes are indicated under Evening Classes for which see page 31.

Fees are strictly payable in advance, and students whose fees remain unpaid after the above mentioned dates will not be admitted to classes.

All deposits must be made before students can be admitted for laboratory work.

Examinations

Examinations are held at the end of each term.

In general, the examinations cover the work of the preceding term, but at the end of the third year, candidates for diplomas may be examined on all of the preceding three years' work.

Examinations for students conditioned in first term subjects are held in May and examinations for students conditioned in the Final Examinations are held in September following.

If a student fails to clear a condition at the time appointed he will be required to repeat or drop the subject; and he cannot be admitted to subjects dependent thereon.

Intermediate examinations are held every five weeks and these serve to inform the student concerning his standing and the progress made.

Daily work and regularity of attendance are considered in making up the reports of standing.

Continued or persistent absence (or tardiness) from the classes is considered reason to exclude a student from the class.

Records and Reports of Standing

Twice during each term informal reports are sent to students, or to guardians of such as are not of age; and at the end of each term formal reports are made.

The daily work of the student forms an important part of his record, and no pupil will be awarded the diploma unless this portion of his record is clear.

Books are prescribed for study, for entry of lecture notes and other exercises, and are periodically examined by the lecturers. The care and accuracy with which these books are kept are considered in determining standing.

Thesis

All candidates for the diploma of the school must file with the Principal not later than May 15, a report of original investigation, or research, written on a good quality of paper, 8x10 inches, with one inch margin at left, and 1-2 inch at right of each page; such thesis to have been previously approved by the head of the department in which it is made.

Graduate Course

Graduates of technical courses of other schools are invited to communicate with the Principal with reference to special courses in the textile studies. Previous training in the engineering branches will usually reduce materially the time necessary to complete any of the courses at this school. The advantages offered to such persons for special research work are unexcelled, and a most profitable course may be arranged.

The Regular Courses

The title of each of the regular courses is an indication of the particular nature of the course, unless it be in the case of Course III. There is a considerable demand for a general textile course in which the whole subject may be treated broadly, and this course is organized with this particular object in view. Certain general studies are included in each course, in order that in specializing, a too narrow view may be avoided.

Special Courses

While it is always urged that regular courses be followed as far as possible, there is opportunity to take any of the subjects taught for which the student is prepared, providing the schedule will permit. All students contemplating a special course should consult with the principal.

Special Awards of Merit

For the past three years a friend of the school has offered prizes in the form of books to be awarded to the successful candidates on graduation day. These prizes are continued this year. The conditions in detail are as follows:

First:—Ten dollars to the student taking the regular Chemistry and Dyeing course in the Lowell Textile School, who shall be considered as having attained the highest scholarship in First Year Chemistry.

Second:—Five dollars to the student taking the regular Chemistry and Dyeing course in the Lowell Textile School, who shall be considered as having attained the second highest scholarship in First Year Chemistry.

Third:—Ten dollars to the regular student of the Chemistry and Dyeing course who shall be considered as having attained the highest scholarship during his second year.

Fourth:—Five dollars to the regular student of the Chemistry and Dyeing course who shall be considered as having attained the second highest scholarship during his second year.

Fifth:—Ten dollars to the regular Chemistry and Dyeing student of either the second or third year class who shall write the best article upon one of five subjects to be specified by the instructing staff of the Chemistry and Dyeing Department.

Sixth:—Twenty dollars to the regular student in the Chemistry and Dyeing course who shall present the best Thesis preparatory to graduation.

The above mentioned sums are to be invested in books which may be selected after graduation. In case no one is considered as being worthy of any particular scholarship prize the same may be withheld. The decision in such case shall rest with the judges.

Diploma

The diploma of the School is awarded upon the satisfactory completion of any one of the regular courses, covering not less than three years, except where entrance is to advanced standing. In such cases at least one year's attendance is required.

Medals of Honor

The National Cotton Manufacturers' Association offers annually a medal to that member of the graduating class from the Cotton Manufacturing course, selected because of his standing and general ability, as best fitted to receive it.

Attendance

All regular students must attend all exercises of their course. Special students must attend exercises as per their Tabular View.

In case of absence explanation must be made to the instructor or the Head of the Department. The effect of such absence upon a student's

standing in the respective study will rest with the Head of the Department, subject to the approval of the Principal.

If a student absents himself from any department to such an extent that in the mind of the Head of the Department he is endangering his standing, he shall be reported to the Principal.

If he is again reported by any department on account of excessive absence he will be called before the Faculty, and required to give suitable explanation.

If he is reported to the Principal for a third time, he may be suspended from the school for the rest of the year.

Conduct

Students are required to return to the proper place all instruments or apparatus used in experimental work and to leave all machinery and apparatus with which they may experiment clean and in working order. All breakages, accidents, or irregularities of any kind must be reported immediately to the head of the department, or instructor in charge.

In cases of either day or evening students, irregular attendance, lack of punctuality, neglect of either school or home work, disorderly or ungentlemanly conduct or general insubordination, are considered good and sufficient reason for the immediate suspension of a student, and a report to the Trustees for such action as they deem necessary to take.

It is the aim of the Trustees so to administer the discipline of the school as to maintain a high standard of integrity and a scrupulous regard for trust. The attempt of any student to present as his own, work which he has not performed, or to pass any examination by improper means, is regarded by the Trustees as a most serious offense and renders the offender liable to immediate suspension or expulsion. The aiding or abetting of a student in any dishonesty is also held to be a grave breach of discipline.

Any student who violates these provisions will be immediately suspended by the Principal and the case reported at the following meeting of the Trustees for action.

Young men abounding in vitality when suddenly cut loose from home and established social environment to acquire an education at a residential school need especially the careful direction of more mature minds in the formation of new associations. The managements of all residential schools are aware that this fact is the cause of considerable anxiety on the part of parents and guardians. The responsibility thus placed upon those under whose care these pupils are committed is profoundly recognized.

The public schools are for boys and girls, the college for youth, the higher technical and professional schools of medicine, law, engineering, etc., are for men. It is now fully recognized that the fundamental idea

of the general educational system, from the kindergarten to the college inclusive, should be the development and establishment of character, and it is therefore expected that those entering the technical schools will have made some progress in self-respect, self-denial and self-control. They enter substantially upon their life work when they matriculate at the higher technical schools and may be placed on their honor as to conduct and not be subject to an irritating and humiliating system of espionage outside of school hours.

In place of such espionage it is the policy of technical schools to rely mainly upon the discipline of the work of the course in connection with ample facilities for physical exercise in the various athletic games and sports, for which ample provision has been made at this school.

Pupils often err in conduct from thoughtlessness and lack of experience rather than through wilfulness, and unconsciously fall into habits because of the lack of intelligent warning and instruction. For this reason, it is proposed to give thorough instruction by lectures, covering the subjects of hygiene, the preservation of physical vigor, morals, thrift, the duties of citizenship, etc. A careful scrutiny will also be maintained by the instruction staff in order to detect in the students any tendency of relaxation in the work or attendance, and all reasonable effort will be made to maintain a high standard of scholarship and morals.

Library

The school library is supplied with leading textile books and with works dealing with science, art or industries allied to the textile trades. The leading textile papers are kept on file.

Sessions

The regular school sessions are in general from 8.30 a. m. to 12.30 p. m., and from 2 to 4.30 p. m., except Saturdays, when the buildings are closed in the afternoon.

A tabular view designates the hours at which the various classes meet. This is rigidly adhered to and the student is marked for his attendance and work as therewith scheduled.

General

Students from a distance, requiring rooms and board in the city, may if they desire it, select the same from a list which is kept at the School. The cost of rooms and board in a good district is from \$6 per week upwards.

All raw stock and yarn provided by the School, and all the productions of the School remain, or become, the property of the Trustees, except by special arrangement, but each student is allowed to retain specimens of yarn or fabrics that he has produced, if mounted and tabulated in accordance with the requirements of the school. It is understood that the Trustees may retain in the School such specimens of student's work as they may determine.

Apparatus used in the Dyeing or Chemical Laboratory is provided by the School, but a deposit must be made by the student at the beginning of the term sufficient to cover its cost, and this deposit will be returned to him at the close of the term, subject to such deduction as will reimburse the School for broken or damaged articles and material used.

Lockers are provided for the use of students, sufficiently capacious to contain clothing, books and tools. The student must provide a good padlock with duplicate keys, one of which must be delivered at the school office where it will be preserved for use while the student remains at school.

No books, instruments, or other property of the School are loaned to the students, to be removed from the premises except by special permission.

Materials

Students must purchase such tools, instruments, text books, and apparatus as may from time to time be recommended by the head of each department, and the cost of these for day students is from \$20 to \$25, and for evening students from \$1 upwards according to the subject studied.

Awards

Gold Medal, Paris Exposition, 1900, for general excellence. A special Medal, Merchants and Manufacturers Exposition, Boston, 1900. The Pan American Medal awarded to the School, 1901. Gold Medal, Louisiana Purchase Exposition, 1904, Gold Medal, Lewis and Clark Centennial Exposition, 1905.

Bulletins and Catalogue

All students registering and paying the regular fee for the course selected are entitled to the Bulletins and Catalogues when issued.

Special bulletins descriptive of the Chemistry and Dyeing Course, the Wool Manufacturing Course, the Cotton Manufacturing Course, the Designing Course and the Textile Engineering Course, have been prepared and may be obtained upon application.

COURSES OF INSTRUCTION

In the column headed "Hours of Exercise" the numbers represent for each particular subject the total hours required for a period of fifteen weeks.

For detail description of the subjects see pages 94-124.

FIRST YEAR

FIRST TERM

(Common to all courses)

	Hours of Exercise
Elements of Mechanism	45
Mechanical Drawing	112
Mathematics,—Algebra	30
Hand Loom Weaving and Elements of Design	55
General Chemistry	187
Decorative Art	}
Freehand Drawing	
English	15
German or French	20

COURSE I. — COTTON MANUFACTURING

The Cotton Manufacturing Course is designed for students contemplating a career in the manufacturing of cotton yarns and cloths or allied industries.

During the first term of the first year, the studies are common to all courses and include instruction in elementary mechanism, mathematics, mechanical drawing, general chemistry and decorative art. Laboratory work supplements the lectures in chemistry and hand loom weaving assists in illustrating the principles of textile design.

The work in the Cotton Yarn Department comprises instruction in all the processes from the bale to the finished yarn. The instruction consists of lectures upon the machines and processes, and laboratory work upon the machines themselves. In the laboratory each student is required to make exhaustive tests upon each machine and all the settings and adjustments possible. The third year's work in this department is largely devoted to lectures upon the manufacture of specialties, waste products, etc., and special laboratory work, special tests upon yarns and fabrics, mill planning with regard to the arrangement of machinery and other work of an advanced nature.

The course in chemistry consists of lecture and laboratory work on inorganic chemistry followed by instruction in textile chemistry and dyeing, including a short course in the dyeing laboratory.

The work in mechanism is followed by steam engineering, electricity, hydraulics and mill engineering. The mechanical drawing taken in connection with these subjects augments this instruction as well as provides opportunity for students to become skilled in draughting.

The course in designing, cloth analysis, and cloth construction includes lectures on plain and fancy weaves and Jacquard work, the analysis of all commercial fabrics, and designs for the same. During the third year of this course students in this department specialize on cotton fabrics.

Power weaving is taken up during the second and third years. Commencing with lectures and practice upon plain looms, the student is taken through dobby and box-loom weaving to Jacquards.

A course in knitting taken during the third year includes the manufacture of hosiery and underwear. There is also a course of lectures on the finishing of cotton fabrics.

For detail description of the subjects see pages 94-124.

COURSE I. — COTTON MANUFACTURING

FIRST YEAR

For First Term see page 83

SECOND TERM

	Hours of Exercise		Hours of Exercise
Cotton Carding and Drawing	127	Textile Chemistry	15
Textile Design, Cloth Analysis	60	Decorative Art	15
Hand Loom Weaving	45	Mechanical Drawing	53
Elements of Mechanism	60	Physics	30
Mathematics—Trigonometry	30	German	22
Elementary Organic Chemistry	30	English	15

SECOND YEAR

FIRST TERM

Cotton Spinning	247	Mechanical Engineering	30
Textile Design, Cloth Analysis	60	Power Loom Weaving	30
Textile Chemistry and Dyeing	30	Physics	30
Machine Drawing	38	Industrial History	15
Weaving Mechanism	15		

SECOND TERM

Cotton Spinning	165	Electrical Engineering	30
Textile Design, Cloth Analysis	60	Power Loom Weaving	60
Textile Chemistry and Dyeing	82	Machine Drawing	38
Mechanical Engineering	30	Physical Measurements	15
Weaving Mechanism	15	Industrial History	15

THIRD YEAR

FIRST TERM

Cotton Yarn Manufacture	172	Knitting Machinery	30
Textile Design, Cloth Analysis	60	Power Loom Weaving	172
Cotton Finishing	15	Mill Engineering	30
		Electrical Engineering	15

SECOND TERM

Cotton Yarn Manufacture	200	Mill Engineering	45
Textile Design, Cloth Analysis	60	Knitting Machinery	30
Power Loom Weaving	142	Physical Laboratory	18
Thesis		Cotton Finishing	15

COURSE II. — WOOL MANUFACTURING

The course of Wool Manufacturing is arranged for those who contemplate a career in the manufacture of woolen or worsted fabrics. It includes instruction in all of the varied processes employed in adapting the wool fibre to cloth, namely,—sorting, scouring, carding, combing, spinning, designing, weaving, dyeing and finishing. The work is carried on by lectures, recitations and practical work in the laboratories.

Following the first term, which is common to all courses, the student in his second term commences work in the Woolen and Worsted Laboratory, and through systematic steps is acquainted with the machines employed in the first steps of yarn manufacturing. At the same time lectures are given upon the many kinds of wool, variation in quality, grades, uses, etc., as influenced by the locality where grown. This is followed by practical work on the sorting table.

The second and third years cover spinning of woolen yarn and worsted yarn by the Bradford and French systems, also the manufacture of tops, including combing, gilling and back washing. Scouring and carbonizing are taken up in detail by lectures and by practical work.

The general chemistry of the first year leads to organic chemistry, followed by textile chemistry and dyeing in the second year. This includes a short course in the Dyeing Laboratory.

Textile designing, cloth analysis and construction are continued from the first year throughout the course, the work being applied especially to woolen and worsted goods. Weaving on power looms commences in the second year and continues through the third.

Lectures on finishing commence with the third year and are augmented by extensive practice with the machines in the Finishing Department.

Work in the Mechanical Department extends throughout all three years and includes mechanical drawing, properties of saturated steam, electricity and hydraulics. The practical application of the principles studied in these subjects is brought out forcibly in the work on mill engineering, where mill design and construction are considered. A short course covering methods employed in the testing of fibres, yarns and cloths, together with laboratory work in the manipulation of certain physical apparatus, is given in the second and third years.

For detail description of the subjects see pages 94-124.

COURSE II. — WOOL MANUFACTURING

FIRST YEAR

For First Term see page 83

SECOND TERM

	Hours of Exercise		Hours of Exercise
Woolen Carding and Spinning	127	Textile Chemistry	15
Textile Design, Cloth Analysis	60	Decorative Art	15
Hand Loom Weaving	45	Mechanical Drawing	53
Elements of Mechanism	60	Physics	30
Mathematics—Trigonometry	30	German	22
Elementary Organic Chemistry	30	English	15

SECOND YEAR

FIRST TERM

Wool Sorting, Scouring and Woolen Spinning	247	Weaving Mechanism	15
Textile Design, Cloth Analysis	60	Mechanical Engineering	30
Textile Chemistry and Dyeing	30	Power Loom Weaving	30
Machine Drawing	38	Physics	30
		Industrial History	15

SECOND TERM

Wool Sorting, Worsted Carding, Combing and Spinning	165	Electrical Engineering	30
Textile Design, Cloth Analysis	60	Power Loom Weaving	60
Textile Chemistry and Dyeing	82	Machine Drawing	38
Mechanical Engineering	30	Physical Measurements	15
Weaving Mechanism	15	Industrial History	15

THIRD YEAR

FIRST TERM

Wool Sorting, Worsted Spinning, English and French Systems	113	Finishing	75
Textile Design, Cloth Analysis	60	Mill Engineering	30
Power Loom Weaving	172	Knitting	30
		Electrical Engineering	15

SECOND TERM

Wool Sorting, Worsted Spinning, English and French Systems	160	Finishing	75
Textile Design, Cloth Analysis	60	Mill Engineering	45
Power Loom Weaving	120	Physical Laboratory	18
Thesis		Knitting	30

COURSE III. — TEXTILE DESIGN

The general course in Textile Design is planned to meet the demand of young men for a technical training in the general processes of textile manufacturing, but with particular reference to the design and construction of fabrics. To this end a foundation is laid in the first year by instruction in mechanics, mechanical drawing, mathematics, chemistry and the elementary principles of designing and weaving. The student is required to pursue a course in the yarn departments, both cotton and wool. By this method he acquires a knowledge of the manufacture of cotton yarns from the bale to the yarn and of woolen and worsted yarns from the fleece through the varied processes of manufacturing woolen yarn or worsted yarn by both the French and Bradford Systems.

Throughout his entire course he receives instruction in design, cloth analysis and construction of all the standard cloths, viz.—trouserings, coatings, suitings, blankets, velvets, corduroys, plushes, etc. This leads into advanced work in Jacquard designing, being supplemented by work in the studio of the Decorative Art Department.

The course in general inorganic and organic chemistry of the first year leads to the subjects of textile chemistry and dyeing in the second year. The instruction includes a short course in the dyeing laboratory.

Power weaving commences with the second year and continues throughout the course.

During the third year the student receives instruction in the Finishing of Woolen and Worsted cloths. This instruction is given by means of lectures and laboratory work.

The instruction in the Mechanical Department is carried along parallel with the other subjects of the course and includes steam, electricity and hydraulics. In the third year mill engineering is taken up and serves to show the application of the principles studied in the previous years. Mechanical drawing extends throughout all three years and finds extensive application in the machine departments.

For detail description of the subjects see pages 94-124.

COURSE III. — TEXTILE DESIGN

FIRST YEAR

For First Term see page 83

SECOND TERM

	Hours of Exercise		Hours of Exercise
Textile Design, Cloth Analysis	128	Textile Chemistry	15
Hand Loom Weaving	45	Mechanical Drawing	53
Elements of Mechanism	60	Cotton Yarn Manufacture	60
Elementary Organic Chemistry	30	Physics	30
Decorative Art	15	French	22
Mathematics—Trigonometry	30	English	15

SECOND YEAR

FIRST TERM

Textile Design, Cloth Analysis	150	Decorative Art	37
Machine Drawing	38	Power and Hand Loom Weaving	68
Textile Chemistry and Dyeing	30	Cotton Yarn Manufacture	83
Mechanical Engineering	30	Physics	30
Weaving Mechanism	15	Industrial History	15

SECOND TERM

Textile Design, Cloth Analysis	120	Woolen Spinning	128
Mechanical Engineering	30	Machine Drawing	38
Textile Chemistry and Dyeing	52	Power Loom Weaving	38
Weaving Mechanism	15	Physical Measurements	15
Electrical Engineering	30	Decorative Art	30
		Industrial History	15

THIRD YEAR

FIRST TERM

Textile Design, Cloth Analysis	142	Mill Engineering	30
Hand Loom Weaving	30	Finishing	75
Power Loom Weaving	75	Decorative Art	38
Worsted Spinning	90	Electrical Engineering	15

SECOND TERM

Textile Design, Cloth Analysis	145	Mill Engineering	45
Power Loom Weaving	98	Finishing	75
Decorative Art	38	Physical Laboratory	18
Thesis		Worsted Spinning	90

COURSE IV. — CHEMISTRY AND DYEING

The regular course in Chemistry and Dyeing is especially recommended to those who intend to enter upon any branch of textile coloring, bleaching, or the manufacture or sale of the various dyestuffs and chemicals used in the textile industry. The theory and practice of all branches of dyeing, printing, bleaching, scouring, etc., are taught by lecture work supplemented with a large amount of laboratory work.

During the first year general chemistry, including both inorganic and organic, is taught by lectures and laboratory work, and this is supplemented during the second term by qualitative analysis and stoichiometry. The lectures upon textile chemistry also begin during the first year.

Advanced inorganic as well as advanced organic chemistry are studied throughout the second year as a continuation of the elementary chemistry of the first year, but the greater part of the time is spent upon quantitative analysis, industrial chemistry and textile chemistry and dyeing.

The third year is devoted to advanced textile chemistry and dyeing, dye testing, dye matching, woolen and worsted finishing, calico printing and cotton finishing, quantitative analysis, industrial chemistry, physical chemistry and thesis work.

The work is taken up in a thorough manner and has been so arranged that the amount of time spent in the laboratories and in class-room work balance each other. Sufficient studies are taken in the other departments to broaden the knowledge of the student in regard to textile work in general, and he is given such training as the time will permit in mathematics, mechanical drawing, modern languages and designing.

The student who conscientiously performs all of the prescribed laboratory work and the practice work should be proficient not only in dyeing and textile printing, but should be well trained in the methods of analysis and the testing of the various chemicals, mordants and dyestuffs so extensively used in the textile industry.

For detail description of the subjects see pages 94-124.

COURSE IV. — CHEMISTRY AND DYEING

FIRST YEAR

For First Term see page 83

SECOND TERM

	Hours of Exercise		Hours of Exercise
Elementary Organic Chemistry	30	Mathematics—Trigonometry	30
Textile Chemistry	15	Mechanical Drawing	30
Stoichiometry	30	Decorative Art	15
Qualitative Analysis	195	Physics	30
Cloth Analysis	30	German	22
Elements of Mechanism	60	English	15

SECOND YEAR

FIRST TERM

Advanced Organic Chemistry	15	Quantitative Analysis	128
Advanced Inorganic Chemistry	30	Heat, Steam Engineering	30
Industrial Chemistry	105	Power Loom Weaving	23
Textile Chemistry and Dyeing	30	Physics	30
Dyeing Laboratory	105	Industrial History	15

OPTIONS

Designing	Advanced Mathematics
Power Loom Weaving	

SECOND TERM

Advanced Organic Chemistry	30	Dyeing Laboratory	258
Advanced Inorganic Chemistry	30	Heat, Steam Engineering	10
Textile Chemistry and Dyeing	15	Electrical Engineering	30
Quantitative Analysis	107	Industrial History	15
Physico-Chem. Measurements	15		

THIRD YEAR

FIRST TERM

Industrial Chemistry	113	Physical Chemistry	30
Advanced Textile Chemistry and Dyeing	30	Quantitative Analysis	98
Dyeing Laboratory	210	Finishing	30

SECOND TERM

Industrial Chemistry	30	Quantitative Analysis	143
Physical Chemistry	15	Woolen and Worsted Finishing	68
Advanced Textile Chemistry and Dyeing	15	Industrial Analysis and Engineer- ing Chemistry	35
Dyeing Laboratory	90	Thesis	115

COURSE VI. — TEXTILE ENGINEERING

The course in Textile Engineering is planned to train the student to meet intelligently the engineering problems of the textile industry as well as to provide him with the essentials of the processes and machines in the varied branches of this industry.

The student is first thoroughly grounded in the broad fundamental principles of science and mathematics underlying all engineering work and textile manufacturing with its many closely allied industries. The most important of the preliminary subjects are mathematics, physics, mechanics and mechanism, and mechanical drawing. The work in mechanism and drawing is particularly thorough and the practical uses of these subjects are considered of first importance. The study of physics while taking up the usual branches included in this subject is given with special reference to problems involved in the physical testing of fibres, yarns and fabrics, etc. The student is required to spend a portion of his time during the course upon the subjects of cotton yarns, woolen and worsted yarns, and power weaving with practical work in each branch. During his first year he has a brief course in the elements of design, and in his second year he pursues a course in textile chemistry and dyeing which is preceded in the first year by the necessary preliminary course in elementary organic and inorganic chemistry. Special importance is attached to the study of power generation, transmission, and measurement and courses with laboratory practice are given in the elements of steam, electrical and hydraulic engineering, to familiarize the student with the means, methods and results available in the modern practice of these branches.

The recently equipped engineering laboratory together with the extensive power plant of the school affords opportunities for a varied line of experimental work including boiler, engine, turbine, generator and pump tests. Systematic instruction in the most approved methods of machine shop practice is provided in the shop which is fully equipped with the best makes of modern tools. This feature of the course is considered a most valuable adjunct to the training of a textile engineer.

The work in mill engineering covers a wide range of subjects including mill construction with calculations and drawings, mill heating, lighting, fire protection, electric driving, etc. The arrangement of plants and machinery for the most economical power distribution and efficient "organization" is also taken up in detail, data for problems being taken from actual cases and the solutions compared with those of some of our best known mill engineers.

For detail description of the subjects see pages 94-124.

COURSE VI. — TEXTILE ENGINEERING

FIRST YEAR

For First Term see page 83

SECOND TERM

	Hours of Exercise		Hours of Exercise
Mathematics—Trigonometry and		Designing (Elements)	60
Analytical Geometry	60	Cotton Yarn Manufacture	60
Machine Drawing	82	Gearing	15
Mechanical Laboratory	38	Physics	30
Elements of Mechanism	60	German	22
Elementary Organic Chemistry	30	English	15
Textile Chemistry	15		

SECOND YEAR

FIRST TERM

Analytical Geometry	45	Mechanical Laboratory	38
Machine Drawing	75	Cotton Yarn Manufacture	127
Steam Engineering	30	Physics	30
Power Loom Weaving	30	Machine Shop	60
Weaving Mechanism	15	Industrial History	15
Textile Chemistry and Dyeing	30		

SECOND TERM

Analytical Geometry	30	Mechanical Laboratory	60
Machine Drawing	38	Electrical Engineering	30
Steam and Hydraulics	30	Woolen Spinning	128
Physical Laboratory	37	Textile Chemistry and Dyeing	15
Power Loom Weaving	38	Thermodynamics	15
Weaving Mechanism	15	Industrial History	15
Machine Shop	60		

THIRD YEAR

FIRST TERM

Worsted Spinning	98	Mechanical Laboratory	83
Differential, Integral Calculus	45	Mill Engineering	45
Mill Engineering Drawing	45	Applied Electricity	15
Physical Laboratory	38	Machine Shop	60
Finishing, Cotton	15	Power Weaving	38
Finishing, Woolen and Worsted	30		

SECOND TERM

Worsted Spinning	98	Mill Engineering Drawing	58
Differential, Integral Calculus	45	Physical Laboratory	18
Mill Engineering	30	Power Plants	15
Machine Shop	60	Electrical Laboratory	60
Finishing, Cotton	15	Power Weaving	45
Finishing, Woolen and Worsted	30	Thesis	
Mechanical Laboratory	38		

OUTLINE OF INSTRUCTION

COTTON DEPARTMENT

Cotton Fiber

- Development of Cotton Spinning Machinery.
- Botanical Varieties—Their Classification and Characteristics.
- Commercial Varieties—Classifications, Characteristics and Adaptatives.
- Microscopical Examination of Various Cottons.
- Points Considered in judging Cotton—Dampness, Color, Uniformity, etc.
- Grading and Stapling—American, Egyptian and Sea Island Cottons.
- Methods of Cultivation and Marketing.
- Ginning—Construction, Operation and Advantages of Saw and Roller Gins.
- Baling—Various forms of Baling Presses and their Products, Characteristics of each.
- Mixing—Object and Methods of Mixing for Per cent., Grade, Variety and Color Mixtures.
- Classification of the Processes of Yarn Manufacture.

Opening and Picking

- Construction and Operation of various machines used in opening and picking cotton, Hopper Bale Breaker, Opener, Automatic Feeder, Breaker, Intermediate and Finisher Pickers, Waste Openers and Cleaning Machines.
- Details of Construction—Cleaning Trunks, Evener Motions, Types of Beaters, Grids and Screens, Lap Measuring Motion, Safety Stop Motion.
- Details of Operation—Regulation of the Air Current, Character and Regulation of the Waste, Drafts of Intermediate and Finisher.
- Adjustment of Feeder, Grid Bars, Lap Racks and Feed Rolls.
- Causes of and Remedies for—Uneven laps, Split laps, Ragged selvages, Dirty laps, etc.
- Cleaning and Oiling.

Carding

- Object and Principles of Carding.
- Construction and Operation of Revolving Flat, Wellman, Foss & Peevey and Roller and Clearer Cards.
- Details of Construction—Feed Plate and Roll, Screens, Flats, Doffer, Combs, Coiler, Mote-knife, etc.

Card Clothing—Various forms of Foundation, Wire, Method of Setting, Number of Points per square foot, Shape and Size of Wire, Methods of Grinding, Method of Cutting Tape and Clothing Cylinder, Doffer and Flats.

Details of Operation—Method of driving various parts, Stripping, Grinding and Burnishing, Setting of various parts, Draft, Speeds and Production, Temperature and Humidity.

Care of Carding Machinery, defects in quality of work and remedies for same.

Character and Regulation of waste.

Sample Carding by hand of at least twelve different blends.

Drawing

Theory of Drawing.

Effect of the Doublings.

Construction and Operation of the Drawing Frame.

Details of Stop Motions, Mechanical and Electrical and advantages of each.

Details of Drawing Rolls, Solid and Shell, Common and Metallic.

Metallic Rolls—Construction, Operation and Advantages.

Roll Covering—Materials used, Roller Cloth, Selection of leather for various kinds of work, Methods of applying leather covering.

Roller Varnish—Its object and methods of applying, recipes for same.

Roll weighting for Common and Metallic Rolls.

Setting of Drawing Rolls for Long and Short Staple, Heavy and Light Slivers, etc.

Minor Details—Clearers, Traverse Motion, Weight Relieving Motion, Trumpets and Condensing.

Amount and proportioning of drafts and tension.

Construction and Operation of Railway Head.

Details of Evener Motion, Stop Motions, etc.

Care of Drawing Machinery, Roller scouring, Cleaning and Oiling, Sizing of sliver, cut sliver and remedies for same.

Roving Processes

Reeling, Weighing and Numbering of Roving by English and Metric Systems.

The Development of the Fly Frame.

Details of Construction of Slubber, Intermediate, Fine and Jack Fly Frames.

Details of the regulation of Draft, Twist, Lay and Tension on fly frames.

Amount of Twist for various cottons and methods of obtaining same.

Builder Motions—English and American types and method of setting and adjusting.

Proportioning and amounts of draft and roller setting.
Creeling, Piecing, Doffing, Cleaning and Oiling.
Stop Motions—Full bobbin. Safety stop, Back Stop motion, Single Roving Stop Motion.
Details of Winding and Regulation of the Tension.
Study of the Differential Motion and its work in the Fly Frame.
Study of the Functions and Development of the Fly Frame Cones.
Defects in adjustment and product of roving machinery and remedies for same.

Ring Spinning and Twisting

Theory of Spinning.
Classification of yarns in regard to uses, Materials, Varieties and Twist.
Reeling, Weighing and Numbering of single and ply yarns.
Construction and Operation of the Ring Frame.
Consideration of Spinning details, thread guides, separators, traveller cleaners, warp and filling bobbins, space of spindles, drum and bands, roving traverse, etc.
Rolls and roll setting, weighting, single and double boss, amount and proportioning of draft for various yarns.
Twist and twist gearing, Amounts for warp, filling and hosiery yarns, ply yarns, etc.
Rings and Travellers, Kinds and methods of determining correct size for various yarns.
Comparison of Single and Double Roving in Spinning.
A Study of the development of the modern Spindle.
The Spinning Builder—Study of the Warp Filling and Combination Builder Mechanisms.
Calculations for Speed, Draft, Twist, etc.
Methods of preparing yarn for Twisting.
The Spooler and Multiple Winder.
Operation of Ring and Flyer Twisters.
A Study of the Wet and Dry Twisting Processes.
Care of the rolls, spindles, bands, doffing.
Uneven, cut and cockled yarns and remedies for same.

Combing

Object of combing.
Kinds of cotton combed and classes of goods requiring combed yarns.
Preparing cotton for Combing, Drawing frame, Sliver lapper, Ribbon Machine.
Combinations of preparatory machines and details of operation.

- A study of the Heilmann Comber and its operation, Feed Motion, Nippers, Cylinders, Detaching Mechanisms, Draw-box, Draft, Waste and Production, Single and Double Nip Machines.
- Setting and Timing the Comber, Regulation of Waste and Production, Weight of lap, etc.
- A Study of the Alsation Comber and its Operation.
- A study of the Nasmith Comber and its Operation.
- Care and management of Combing Machinery.

Mule Spinning

- A Comparison of Throstle, Ring and Mule Spinning and the Products of each Machine.
- Advantages and Disadvantages of each machine.
- Construction and Operation of the Self Acting Mule.
- Details of Operation, Drawing and Twisting, Backing off, Winding, Re-engaging.
- Details of Construction, Builder Motion, Quadrant, Roller Motion, Nosing Motions, Jacking Motions, etc.
- A Study of Building and Winding.
- Calculation of Draft, Twist, Drag, Production.
- Causes of and remedies for, Kinky yarn, Soft cops, Ridgy cops, Uneven chase, etc.

Organization

- Methods of handling Cotton Waste, Details of the manufacture of Cotton Wadding and other Waste Products.
- Details of Fine Yarn Spinning, the manufacture of Sewing Thread, Lace Yarns, Twines and Cords.
- The Manufacture of Fancy Yarns, Nub, Soop, Splash, Spiral Yarns, Flake Yarns, etc.
- Factory Organization for various sizes and styles of yarns, Equipment, Programs, Balance of Production, Cost of Machinery, Power, etc.
- The Economic Arrangement of Cotton Machinery.
- Life of Cotton Machinery, Depreciation and Valuations.
- Factory Cost Systems, Inventory, Productive and Non-Productive Labor, Supplies, Maintenance, General Expenses, etc.

Knitting

The course in Knitting is designed to meet the needs of those requiring special work in this branch, as well as those desiring only a general knowledge of the subject and is given to Third Year students of courses I, II and VI. The course begins with lectures upon the yarns used and the preliminary operations, and continues with the construction and operation of the various makes of knitting machines as applied to circular and flat knitting.

Beginning with the hand stocking frame, the student is given instruction upon the machines used for hosiery and the flat machines used in the manufacture of gloves, sweaters and jackets.

Following is a list of subjects taken up:

Knitting Yarns and Their Manufacture.

Operations preliminary to Knitting.

Winding—Cone Winding, The Payne Winder.

Development of Knitting.

Knitting Needles—Their Construction and Operation.

Latch Needles, Spring Needles.

Method of Producing Standard Stitches.

Study of the Plain, Rib and Tuck Stitches and their uses.

Circular and Flat Knitting Machines. ,

Operations involved in the Manufacture of Seamless Hosiery.

Study of the production of the Rib Top.

Details of Construction and Operation of the Circular Rib Knitting

Machine, including a consideration of Stop Motions, Needle Cams,

Pattern Wheels, Splicing Attachments, Measuring Devices, etc.

Transferring of Rib Tops.

Details of Construction and Operation of the Seamless Hosiery Ma-

chine, including a study of Stop Motions, Plating Attachments,

Pattern Wheels and Chains, Shaping the Heel and Toe, Rein-

forcing the Heel and Toe, Loosening the Stitch for Reinforcing

and Shaping, Semi, Three-quarter and Full Automatic Hosiery

Machines.

Construction of the Looper and Study of its Operation. Regulation of Tension, etc.

Designing on Seamless Hosiery Machines—Study of the Production of Fancy Stitches, Designing by means of Colored Threads.

Size of Yarn for Various Work and Gauges.

Study of the Finishing of Hosiery—Washing, Dyeing, Boarding, Mending, Pressing, Pairing, Stamping, etc.

Imperfections in Circular Knit Goods and Remedies for Same—Dropped Stitches, Curled Work, Ragged Edges, Stains, Streaked Work, etc.

A Study of the Flat Knitting Machines—The Lamb Principle as applied to Glove and Sweater Manufacture.

The Jacquard as applied to Flat Knitting Machinery.

WOOLEN AND WORSTED DEPARTMENT

Raw Materials

Animal Fibres—Wool, Silk, Mohair, Alpaca, Vicuna, Cashmere, Camel Hair, etc.

Vegetable Fibres—Cotton, Flax, Hemp, Jute, Ramie.

Wool Substitutes—Noil, Shoddy, Mungo, Extracts.

Waste Products manufactured on Woollen machinery—Cotton Waste, Linters, Flax, Hemp, and Jute Waste.

Sources of supply and relative values of above.

Chemical and Physical properties and Composition.

Microscopical examination.

Wool Fibre

Physical and chemical structure—Differences between wool, hair and fur—

Physical properties, Strength, Elasticity, Curl, Lustre, etc.

Felting Property—Hygroscopic Property.

Structure and causes of Kemps.

Definitions of trade terms—Picklock, XXX, XX, 1-2 Blood, 3-8 Blood, 1-4 Blood, Delaine, Braid, etc.

Pulled Wools—Their uses and classification.

Wool Sorting

Differences between Sorting and Grading—Sorting and Blending.

Judging Spinning Qualities.

Estimating Shrinkage.

Definitions of trade terms—Cots, Hog, Shurled, Hogget, Wether, Fribs, Paint, Stain, Shoulder, Cast, etc.

Wool Scouring

Object of Wool Scouring.

Composition of Yolk and Suint.

Cholesterol and Lanolin.

Materials used as detergents.

Emulsion Process—Use of Soda, Potash, Hard and Soft Soaps.

Manufacture of Scouring Soaps with tests for impurities.

Water in Wool Scouring with tests for hardness, etc.

Effect of heat on Wool Fibre with proper heat of scouring liquor.

Recovery of potash salts and wool fat from waste scouring liquor.

The Solvent process—Degreasing Wool, with Naphtha.

Construction and use of Scouring Machines and Rinse Boxes with Speeds, Adjustments and Productions.

Construction and use of Dryers, Table and Artificial.
Effect of heat on Lustre; proper heat for various classes of Wool—
(Braid, Botany, Mohair, etc.).

Carbonizing

Object of Carbonizing.
Carbonizing Wool, Noils, Burr Waste, Rags, etc.
Carbonizing Agents—Sulphuric Acid, Aluminum, Chloride, etc.
Hydrometers.
Strength of Carbonizing Agents.
Carbonizing with Acid Gases.
Neutralizing.

Burr Picking

Object of Burr Picking—What wools are Burr Picked and why they
are not carbonized.
Construction and Use of the several Kinds of Burr Pickers.
Adjustments, Speeds and Production of same.

Mixing and Oiling

Object of Mixing. Laying down lots.
Mixing Different colors of Wool.
Mixing Wool with Cotton, Shoddy, Noils, etc.
Object of Oiling—Discussion of various Kinds of Oils used, Olive,
Lard, etc.
Oil Testing, Viscosity, Flashing Point, etc.
Manufacture of Emulsions.
Construction and Use of Automatic Oilers, Feeds and Pickers.
Speeds, Productions and Calculations for cost of Lots when materials
of different values are used.

Carding

Principles of Carding.
Functions of various parts—Feed Rolls, Lickerins, Tumblers, Work-
ers, Strippers, Cylinders, Fancies, Dickies, Doffers, etc.
Construction of various parts.
Direction of Revolution and Speeds.
Card Clothing —Construction and uses of the various Kinds of Back-
ing: Leather, Flexifort, etc.—The several Kinds of Wire—Gar-
nett, Metallic, Convex, Lickerin. etc.
The "Counts and Crown" method of counting Card Clothing.
Card Adjusting and the use of Card Sets.
Clothing the Card.
Card Grinding and Grinders, Solid Roll, Traverse, Screw and Chain.

Woolen Cards

Construction and use of the First Breaker, Second Breaker and Finisher.

Various methods of coupling Cards.

Card with Breast.

Woolen Card Feeds—Object, Construction, and use of Automatic Feeds for First Breaker, Bramwell, etc.

The Construction and use of the several Kinds of Automatic Feeds for Second Breaker and Finisher, Apperly, Torrance Balling Head and Creel, Bates, Kemp, Scotch, etc.

Condensers, Rub Roll, Combination, Double Apron, etc.

Calculations for Proper Weight of Rovings, Speeds, Productions, etc.

SAMPLE CARDING.—Each student is required to make at least twenty sample Mixes combining different colors and grades of Stock and to Felt and Mount the same. Part of the Carding to be done by Hand Cards and part on the Torrance Sample Mixing Card.

Woolen Mule

Principles of Spinning. History and development.

Hand Jack, Self-operating and Self-acting Mules. The Mule-head.

Methods of Driving the various parts, Rolls, Spindles, Carriages, etc. Backing-off. Winding Mechanism.

Study of the Quadrant and Builder-rail. Regulation of the Fallers.

Double Spinning. Twisting on Mule and on Woolen Twister.

With the above lectures will be given all the necessary calculations and actual practice on the various machines.

Worsted

Top Making

CARDING AND PREPARING—The principles of Worsted Carding—Types of Worsted Cards, Double Cylinder Lickerin, Breast, etc.

Speeds, Settings, Feeds, Adjustments, Productions.

PREPARING—Differences between Carding and Preparing—What Wools are Prepared and why they are not Carded. The use of Emulsions. A Set of Preparers. The calculations for Drafts on any Gill Box. The Clough Gill Box.

The proper Drafts in Preparing—Adjustments, Speeds, Productions, Calculations, etc.

GILLING AFTER CARDING—Number of Doublings, etc.

Combing

The principles, history and development of Worsted Combing.

Combing on the Noble and Lister machines.

Calculations for Draft—Settings, Speeds, Productions, etc.

Per cent. of Noil.

GILLING AFTER COMBING—Proper Drafts and calculations for Doublings.

BACK WASHING—The object and nature of the process—Backwashing Liquors, Composition, Heat, etc.

The Hygroscopic property of Wool—Conditioning of Tops—Top Mixing.

Open Drawing or Bradford System

The Principles of Drawing. Numbers of Operations for different Counts of yarn. The use of Logarithms in Drawing Calculations, Study of the Drag—Calculations for Drafts and Twists—Proper Ratch.

The functions of the Weigh Box.

Measuring Stop Motions, Candle Stick, Side Knock-off, etc.

Calculations for length.

Construction and use of Gauge Points or Constants.

Effects of Doubling.

The Dram and Hank Systems for numbering Roving.

Cone Drawing

The object and use of Cone Drawing—Differential Motions, Builder Motions—Calculations for Draft—Twist—Tension and Lay—Adjustments, Speeds and Productions.

French Drawing

The principles and use of French Drawing—Functions of the Porcupine. The principle of Condensing—Manufacturing of Merino Yarns.

Spinning, Open or Bradford System

The Principles of Spinning. Calculations for Draft and Twist—Spinning on the Cap—Flyer and Ring Frames—The Scaife Builder Motion—Drag in Bradford System of Spinning—The use of Straight, Conical and Bell Mouthed Caps. Top Roll, Single and Double Covered, Iron and Wood.

Types of Frames, Leicester and Illingworth; Speeds, Productions, etc.

Spinning, French System.

Principles of Worsted Mule Spinning, Calculations for Draft and Twist, Ratch, Drag, Backing off, Winding, Re-engaging, Size and shape of Caps, Builder Motion, Quadrant, Metric and English systems of Calculations.

Twisting

Principles of Twisting, Reeling, Weighing and Numbering of Single and Ply Yarns, Twisting on Cap, Flyer and Ring Frames—Calculations for Twist—Twist testing—Trap Twisters—Effect of direction of Twist; Speeds, Productions, Yarn Testing, etc.

The true difference between Woolen and Worsted Yarns. Layout of Machinery for different classes of Yarns—Power required for different machines—Cost of Machinery and approximate labor cost of each Department, Sorting, Scouring, Carbonizing, Picking, Carding, Combing, Drawing, Spinning, Twisting, etc., for various classes of Yarns, Carpet, Braid, Botany, etc.

DESIGNING AND POWER WEAVING DEPARTMENT

Textile Design

This course is taken by students of all manufacturing courses throughout the entire three years. Students of Courses IV and VI pursue the subject during a part or the whole of the first year only. The instruction takes up the subjects of Classification of fabrics, use of point or design paper, plain fabrics, intersection, twills and their derivation, sateen, basket and rib weaves, checks and stripes, fancy weaves including figured and colored effects; producing chain and draw from design and vice versa; extending and extracting weaves.

The work of the second year follows with consideration of fancy and reverse twills, diaper work, damask, skip weaves, sateen fabrics with plain ground, backed fabrics, and multiple ply fabrics. Students are required to make original designs and reproduction of analyzed samples and put the same into the loom. Special attention is given to the consideration of color effects.

The advanced work of the third year takes up the more complicated weaves adapted to harness work and leads into leno and Jacquard designs. The following is a brief list of the subject heads which will give some idea of the course: Double plain cloths, Ingrains, Tricots, Chinchilla, Tapestry, Blankets, Upholsteries, Spot weaves, Pile or Plush, Crepon, Matelasse and its imitation, Pique, Marseilles, Quilting, Miscellaneous designs for Jacquard, Lenos, Fustian, Tissue fabrics, Lappets, etc.

The same plan is pursued during this year as in the second year, that of requiring the students to make original designs and to weave the same.

Fabric Analysis

This subject is taken by all courses during the first year, and is continued during the second and third years by Courses I, II, and III. It takes up in a systematic manner the analysis of samples illustrating the various cloth constructions for the purpose of determining the design of the weave, the amount and kind of yarns used and forms the basis of calculation in the cost of reproducing any style of goods. The various headings discussed are, Reeds and Setts, Relation and determination of counts of cotton, woolen, worsted, silk, and yarns made from the great variety of vegetable fibres. Grading of yarns, folded, ply, novelty and fancy yarns. Application of the metric system to yarn calculation. Problems involving the use of both English and Metric systems. Problems involving take-up and shrinkage, average counts, determination of counts of yarn, weight of yarn required to produce a given fabric, determining diameters of yarns. Methods of testing yarns. Question involving loom productions, mixes, blends, etc.

Practical Work

In connection with the above outlined work practical work is carried on upon the hand looms and upon the power looms. This includes the preparation of warps, beaming, dressing, sizing, drawing-in and making of chains, the cutting and lacing of cards. Spooling and quilling and the machinery for the same. A study is made of warpers, sizing machines both for cotton and woolen. Lectures are given properly timed to correspond with the progress of the student in the Power Weaving laboratory covering the following subjects:

Loom adjustments, chain building, shuttle changing looms, dobby looms, single and double acting dobbies, handkerchief motions, leno weaving, centre selvedge motions, filling changing looms, oscillating reeds, lappet motions, various shaker motions, towel and other pile cloth weaving, Jacquard looms, single and double lift leno Jacquards, Jacquards of special design, tying up Jacquard harness. The consideration of the mechanical operation and design of the special mechanisms and the calculations involved is taken up by the Engineering Department in a course of weaving mechanism for which see page 120.

Textile Costs

There has recently been organized a course of lectures and class work for the purpose of giving instruction upon the systems of determining the costs of producing textile yarns and fabrics, as well as the value of the materials at various stages in the process of manufacture. It is not the plan of this course to teach one particular system of cost finding to the

exclusion of all others but rather to give the general fundamental principles applicable in any system, to show the interrelationship of the various departments and the duties of the various officers. The list of the headings under which the instruction is given will give some idea of the ground covered.

Requirements in a cost system.

Comparison of new and old methods.

Organization of a mill and the relationship of the departments.

Administrative, Manufacturing, Commercial Divisions.

Distribution of expenses.

Depreciation.

Labor and its subdivisions: Day work—Piece work, etc. Premium labor, Differential labor.

Details in processes in manufacturing influencing costs.

Inventories.

Numbering or lettering processes applied to cost systems.

Material tables.

Time cards.

Weekly department cards.

Use of charts in showing comparison of costs.

Wastes, leaks.

Problems are frequently given for the purpose of illustration and to assist in fixing the principles involved clearly in mind.

DECORATIVE ART DEPARTMENT

FIRST YEAR

First term. Letters and Lettering

All students attend lectures and class work. This work is conducted with the view to give an understanding of the principles which govern the proportion and delineation of the various types of letters, and at the same time affords practice in the formation of letters, in spacing, and in the arrangement of a sheet. Lectures cover the following subjects: Systems of proportion, obtrusive letter forms and their reduction. Spacing of letters, words, lines and pages. Shading and methods of working and handling of materials. With each system of letters, characteristic lines and their terminations are given studied attention. The desk work consists of detailed drawings of individual letters, and the composition of letters, words, lines and pages.

Second term. Color—for Courses I-II-III-IV

Realizing the importance of color in textile manufacture this subject is given careful consideration. The course is designed first, to give a student a precise vocabulary and a clear understanding of the modifications of pure color; second, to give him a working knowledge of color as

related to the mixture of pigments, the mixture of yarns, and harmony. Sketches are given upon the following subjects: Nomenclature, Mixture of Pigments, Mixture of color in invisible areas, Simultaneous contrasts of hue and value, Properties of individual hues, values, and intensities, Influence of contiguous areas, Use of outlines, and Harmony. The desk work is planned to train the eye and illustrate the principles taught in the lectures as well as to give the student practical experience in the mixture of pigments, matching of colors and arrangement of color harmonies.

SECOND AND THIRD YEARS

Decorative Design for Course III

Beginning with print goods, madras, gingham, etc., this work comprises a study and practice in the designing and rendering of fabrics from those of the simplest order to the more elaborate such as upholstery goods, and carpets. Lectures are given upon the general principles of design, the decorative use of weaves, the chromatic effect of weaves upon yarn, characteristics of various classes of goods and their influence upon design and color, systems of planning and repeats. Working methods of drawing, painting, enlargements to point-paper and optical effects.

Decorative Art for Special Students

This course is planned to give a student a working knowledge and appreciation of design. The first and second years are devoted to a general study of design, color, perspective, lettering and rendering. Drawings are made in the Historic styles for all materials—wood, gold, silver, copper, brass, leather, fabrics, wall papers, and glass.

In the third year students should specialize and devote their attention to the material in which they expect to work. Thus a student may make a special study of jewelry, gold and silver ware, brass and bronze work, fabrics, wall papers, furniture, interior finish, or stained glass, etc.

CHEMISTRY AND DYEING DEPARTMENT

Elementary Chemistry

This subject is required not only of the students taking the regular course in Chemistry and Dyeing, but by all others intending to take a complete course and receive the school diploma.

It extends through one entire year and includes lectures, recitations, and a large amount of individual laboratory work upon the following subjects:

Chemical Philosophy

Chemical action, chemical combination, combining weights, atomic weights, chemical equations, acids, bases, salts, Avogadro's law, molecular weights, formulas, valence, periodic law, etc.

Non-Metallic Elements

Study of their occurrence, properties, preparation, chemical compounds, etc.

Metallic Elements

Study of their occurrence, properties, metallurgy, chemical compounds, etc.

The Hydrocarbons and their Derivatives

Study of their occurrence, properties, preparation, uses, etc. This work although elementary in character is of sufficient breadth to prepare the student understandingly for the work with the artificial dyestuffs which follows.

Qualitative Analysis

Before the completion of the course, the student takes up as thoroughly as the time will permit, the qualitative detection of the more common metals and non-metals, with practical work.

Qualitative Analysis

Qualitative Analysis is studied by all regular students in Course IV during the second term of the first year. The work is based upon Prescott and Johnson's Qualitative Chemical Analysis and consists of one lecture, one recitation, and not less than twelve hours laboratory work per week. The student must become familiar with the separations and the detections of the common metals and acids by the analysis of a satisfactory number of solutions, salts, alloys, pigments, etc. At intervals during the term, short laboratory tests are given as well as the regular written examinations.

No pains are spared to make the course as valuable to the student as possible and to encourage only thorough and intelligent work.

When sufficiently advanced, students take up the examination of various products with which the textile chemist must be familiar, such as testing mordanted cloths, pigments, and the various dyeing reagents.

During the latter part of this course a certain amount of time is devoted to the preliminary operations of Quantitative Analysis, such as

the precipitation and washing of such substances as barium sulphate, magnesium ammonium phosphate, calcium oxalate, etc., although no weighings or actual determinations are made.

A student's marks in this subject depend as much upon the neatness and care used in manipulation as upon the actual results obtained.

Stoichiometry

This subject is taken up by the Chemistry and Dyeing student during the second half of the first year.

The application of the metric system is thoroughly studied, and problems are worked involving the expansion and contraction of gases, determination of empirical formulae, combining volume of gases, quantitative analysis, etc.

Advanced Inorganic Chemistry

The whole subject of Inorganic Chemistry is reviewed during the second year, and many advanced topics are introduced which were necessarily omitted from the first year course in General Chemistry.

Advanced Organic Chemistry

The course consists of lectures and recitations extending through the second year. The principles of organic substitution and synthesis are thoroughly discussed using as many illustrations as the time will permit, particularly such as are applied in the arts. The alliphatic series of hydrocarbons and their derivatives are studied for about twenty weeks of the year, the remainder of the time being devoted to the benzene series. The aim of the course is to lay a broad foundation for the chemistry of the artificial dyestuffs, which is studied in the third year. Students are required to work out problems in the synthesis of various compounds in order to get familiarized with equation writing.

Physical Chemistry

This subject is studied during the third year.

It includes the principles of calorimetry, specific heat, vapor density, the various methods of determining molecular weights, laws of solution, electrolytic dissociation, theories of precipitation, thermo-chemistry, surface tension, etc. The student is required to work out a large number of problems introduced by the subject.

Quantitative Analysis

This subject is taken up by all regular Chemistry and Dyeing students, and extends through the second and third years of the course.

During the second year, the principles of analytical work are thoroughly taught, the work being based on Talbot's Quantitative Chemical

Analysis. Gravimetric analysis is studied during the first term, and volumetric analysis during the second term. The samples analyzed include salts, ores, minerals, bleaching powder and alkalies. Frequent recitations are held for the discussion of methods and the solution of stoichiometrical problems. Students are encouraged to read the standard works and magazines on chemical subjects, in order to cultivate broad views of the science.

The third year work involves chiefly technical analysis, the principal consideration being the analysis of water, alum, ammonia, soaps, coal, indigo, tannin, and the ultimate analysis of organic compounds, as well as the examination of acids, alkalis, oils, scouring materials and such substances as starches, gums, and other thickeners, detection of adulterants, etc.

No pains are spared to give the students the benefits of all the latest researches along the lines of industrial analytical methods, and original work is encouraged in all.

Textile Chemistry and Dyeing

Under this head is included first, the lecture course in Textile Chemistry and Dyeing, which is taken by all regular diploma students; second, the general laboratory course taken by all regular diploma students, except those taking Course IV, and the laboratory and practical work course which is taken by the regular Chemistry and Dyeing students.

OUTLINE OF LECTURE COURSE

Technology of Vegetable Fibres

Cotton, Linen, Jute, Hemp, China Grass, etc. Chemical and physical properties, chemical composition, microscopical study, and their action with chemicals, acids, alkalies, heat, etc.

Technology of Animal Fibres

Wool, Mohair, Silk, etc. Chemical and physical properties, chemical composition, microscopical study, and their action with chemicals, acids, alkalies, heat, etc.

Technology of Artificial Fibres

Study of the various forms of artificial silk, the process of manufacture, their properties and action with chemicals, acids, heat, etc.

Operations Preliminary to Dyeing

Bleaching of cotton and linen, wool scouring, bleaching, fulling and felting of wool, carbonizing, silk scouring and bleaching, action of soap.

The bleaching of cotton cloth, yarn and raw stock is studied at length with detailed descriptions of the various forms of kiers and machinery used; also the action of the chemicals used upon the material and the various precautions that must be taken in order to insure successful work.

Under this heading is also included an exhaustive study of the reagents used in emulsive wool scouring process and their action upon the fiber under various conditions; also the most successful of the solvent methods for degreasing wool.

Water and its Application in the Textile Industry

Impurities present, methods for detection, their effect during the different operations of bleaching, scouring, dyeing and printing, and the methods for their removal or correction.

The important subject of boiler waters is also studied under this heading with a full discussion of the formation of boiler scale, its disastrous results and the methods by which it may be prevented.

Mordants and Other Chemical Compounds used in Textile Coloring not Classified as Dyestuffs

Theory of mordants, their chemical properties and their application, aluminum mordants, iron mordants, tin mordants, chromium mordants, organic mordants, tannin materials, soluble oil, fixing agents, levelling agents, assistants, and numerous other compounds not dyestuffs that are extensively used in the textile industry.

Under this heading is included the definitions of various terms and classes of compounds, used by textile colorists, such as color lakes, pigments, fixing agents, developing agents, mordanting assistants, mordanting principles, levelling agents, etc.

Theory of Dyeing

A discussion of the chemical, mechanical, solution and absorption theories, and the various views that have been advanced by different investigators of the chemistry and physics of textile coloring processes.

Under this heading is discussed the general methods of classifying dyestuffs and definitions of such terms as textile coloring, dyeing, textile printing, substantive and adjective dyestuffs, monogenetic and polygenetic dyestuffs, etc.

Natural Coloring Matters

Organic, properties, an application of indigo, logwood, catechu or cutch, Brazil wood, cochineal, fustic, tumeric, madder, quercitron bark, Persian berries, and other natural dyestuffs that have been used within recent years by textile colorists.

Mineral Coloring Matters

Under this heading are discussed the properties of such inorganic coloring matters and pigments as chrome yellow, orange and green, Prussian blue, manganese brown, iron buff, etc.

Artificial Coloring Matters

General discussion of their history, nature, source, methods of manufacture, methods of classification, and their application to all fibers.

Special study of:—

Basic Coloring Matters.

Phthalic Anhydride Colors, including the eosins, phloxines, etc.

Acid Dyestuffs.

Janus Colors.

Direct Cotton Colors.

Sulphur Colors.

Mordant Colors, including the alizarines and other artificial coloring matters requiring metallic mordants.

Mordant Acid-Colors.

Insoluble Azo Colors, developed on the fiber.

Reduction Vat Colors, including Artificial Indigo, Indanthrene, Flavanthrene, Viridanthrene and Melanthrene.

Aniline Black and other artificial dyestuffs not coming under the above heads.

As each class of dyestuffs is taken up, the detail of the methods of applying them upon all the different classes of fabrics and in all the different forms of dyeing machines are thoroughly discussed; also the difficulties which may arise in their application, and the methods adopted for overcoming them.

Machinery used in Dyeing

A certain amount of time is devoted to the description of the machinery used in the various processes of textile coloring, which is supplemented as far as possible by the use of charts, diagrams, lantern slides, etc.

Most of the important types of dyeing machines are installed within the dyehouse of the School and the students can be taken directly from the lecture room and shown the machines in actual operation.

Outline of Laboratory and Practical Work

Besides lectures and recitations upon this subject, those taking the regular day course in Chemistry and Dyeing are required to do at least fifteen hours per week of practical laboratory work. By the performance

of careful and systematic experiments the student learns the nature of the various dyestuffs and mordants, their coloring properties, their action under various circumstances and the conditions under which they give the best results. The more representative dyestuffs of each class are applied to cotton, wool and silk, and each student is obliged to enter in an especially arranged sample book, a specimen of each of his dye trials with full particulars as to the conditions of experiment, percentage of compounds used, time, temperature of dye bath, etc.

For convenience and economy most of the dye trials are made upon small skeins or swatches of the required material, but from time to time students are required to dye larger quantities, in the full sized dyeing machines which are described elsewhere.

By the use of a small printing machine the principles of calico printing are illustrated, and by means of the full sized dyeing machines, vats, etc., the practical side of the subject is studied. It is the constant endeavor of those in charge, to impart such information of a theoretical and scientific character as will be of value in the operation of a dyehouse.

Advanced Textile Chemistry and Dyeing

This is a continuation of the Textile Chemistry and Dyeing of the second year and includes a review of the second year's work in this subject, with the introduction of many advanced considerations, and in addition the following subjects:—

Classification and Construction of Artificial Dyestuffs

A study from a more advanced standpoint of the classification and constitution of artificial dyestuffs, including the various methods used in their production, also the orientation of the various groups which are characteristic of these compounds, and their effect on the tinctorial power of dyestuffs.

The object of this study is to give the student a more complete knowledge of the artificial dyestuffs from the color manufacturer's point of view, and it will prove of particular value to those who intend later to enter the employ of dyestuff manufacturers or dealers.

This subject cannot be taken by students who have not completed the second year course in Organic Chemistry.

Color Matching and Color Combining

A study of that portion of physics which deals with color, and of the many color phenomena of interest to the textile colorist, the lecture work being supplemented with the practical application of the spectroscope and tintometer, and much practice in the matching of dyed samples of textile material.

The primary colors both of the scientist and textile colorist and the results of combining colored lights and pigments, and such subjects as color perception, color contrast, purity of color, luminosity, hue, color blindness, dichroism, fluorescence, and the effect of different kinds upon dyed fabrics are discussed under this heading.

Each student's eyes are tested for color blindness early in the course in order that he may be given an opportunity to change his course if his eyes should prove defective enough to interfere with his work as a textile colorist.

A dark room has been provided where various experiments in color work and color matching may be performed.

Dye Testing

This subject includes the testing of several dyestuffs of each class, to all the common color destroying agencies, the determination of their characteristic properties and their action towards the different fibers. Also the determination of the actual money value and coloring power of dyestuffs in terms of a known standard.

Each student is required to make a record of each color tested upon an especially prepared card which furnishes a permanent record of the dyestuffs, its dyeing properties, fastness to light and weather, washing, soaping, fulling, perspiration, bleaching, steaming, ironing, rubbing, acids and alkalis.

Union Dyeing

A study of the principles involved in the dyeing of cotton and wool, cotton and silk, and silk and wool union materials with the production of solid and two color effects.

Textile Printing

A thorough study of the whole subject of textile printing, each student being required to individually produce no less than twenty different prints including the following styles:— Pigment style, direct printing style, steam style with tannin mordant, steam style with metallic mordant, madder or dyed style, the ingrain or developed azo style, discharge dyed style, discharge mordanted style, resist style, indigo printing, aniline black printing.

The different parts of the calico printing machine are thoroughly studied, the precautions which must be considered in its use and the arrangement of the dyeing apparatus which must accompany such a machine.

Special attention is paid to the methods of mixing and preparing the various color printing pastes that are used in the above work upon the manufacturing scale as well as experimentally in the laboratory.

Cotton Finishing

A study of the various processes of finishing cotton cloth, and the different materials used therein. The work involves the discussion of the various objects of cotton finishing and such operations as pasting, damping, calendering, stretching, stiffening and filling, and the various machines used for carrying out these processes.

Mill Visits

During the third year, visits are made to some of the large dyehouses, bleacheries and printworks in the vicinity.

Industrial Chemistry

Special attention has been given to this subject, because it is considered extremely important in the study of chemistry in general, and of textile chemistry in particular. During the second year considerable time is spent in the laboratory in the actual manufacture, from raw materials, of the chemical compounds used in textile work. Each student is required to make careful record of all of the crude materials used, as starting points, and to carry the various processes through as carefully as possible with the view of producing as great and pure a yield of each substance as possible. Industrial Chemistry not only involves the application of the principles of both inorganic and organic chemistry, but of analytical work as well, for the purity of the compounds produced must be tested after their manufacture.

In addition to the general work in this subject, each student is required to make a special study of the manufacture of some chemical from raw materials in considerable quantity (20 to 25 pounds) making a complete quantitative analysis of all the raw materials used and of the finished product, accounting for everything throughout the process with the object of producing as near the theoretical yield as possible. The student is charged with amount of raw materials at market prices, and the finished product is bought back by the school.

During the past year extensive construction work and much new apparatus has been added to the industrial chemistry laboratory and it is now believed to be one of the most complete of its kind. The present equipment allows of a comparatively large quantity of materials being handled at one time.

During the whole of the third year, lectures and recitations are held in Industrial Chemistry, the course in general following "Thorpe's Outline of Industrial Chemistry." Particular attention is paid to those subjects which are of special interest to the textile chemist, as oils, soaps, gas and coal tar industry, building materials and the manufacture on a large scale of important chemical compounds, such as the common acids and alkalies, bleaching powder, various mordants, etc. The course is illustrated as far as possible with specimens, diagrams and charts, and the students are given an opportunity to visit some of the industrial establishments in the vicinity of Lowell and Boston.

Engineering Chemistry

During the second term of the third year a series of lectures will be given upon the general subject of Engineering Chemistry, which will include particularly the consideration of fuels, oils, and water from the chemical engineer's stand point. The elements of Chemical Engineering will also be considered to such an extent as time will permit.

In conjunction with this course, there will be required a specified amount of laboratory work in the Industrial Analysis Laboratory which has been recently thoroughly equipped with the latest and best apparatus for fuel and oil analysis.

Microscopy

The value of the microscope in the detection and examination of the various fibres cannot be over-estimated, and often facts may be discovered, and conclusions drawn, which could be arrived at in no other way.

The students in this course are given as much work with the microscope as time will permit. They receive instruction in the use of the high grade microscopes, and not only have practice in the examination and detection of the fibres, but are required to become proficient in the preparation of permanent slides.

Opportunity is also given for students to take microphotographs of fibres and the various slides which they may prepare. A special dark room has been provided for this purpose.

FINISHING DEPARTMENT

Woolen and Worsted Fabrics

Burling and Mending

Under this head is taken up for consideration the examination of flannel as it comes from the loom, the construction, use, and location of the perch, the methods used in marking defects, measuring, weighing, and numbering of cloths, also the methods of inspection for fan-cies, single cloths, double cloths, etc. The object of burling, mending,

and the types of tables employed, the method of removing knots, runners, etc., the object of back shearing and the use of burling irons, the replacing of missing threads and the importance of sewing as a part of the finishing process, are all considered in detail. The removal of oil and tar spots as well as stains of various kinds is studied.

Fulling

This branch covers a study of the condition of the flannel as it comes from the loom, the influence of oil, size, etc. upon the procedure. Considerable time is devoted to the various methods of producing a felt, the early types of stocks, hammer falling, crank stocks, etc., and their modifications and development into the present type of rotary fulling mills of both the single and double variety. The details of construction in all machines are carefully taken up and include the design and composition of the main rolls, methods of covering, regulation and means of adjusting the pressures of traps and rolls, consideration of the shoes, the use and regulation of the various types of stop motions, the different types of stretchers, guide rolls, and throat plates.

The theory of felt is taken up and the influence of pressure, moisture, heat, alkali, and acid is considered as well as the hydroscopic and felting properties of different wool fibres. The preparation of the flannel for the mill and the usual methods of determining shrinkages as well as the various methods of soaping obtain careful attention. The preparation of various fulling soaps and the value of each for the production of various degrees of felt as well as the determination of the proper amount of alkali for various goods are carefully studied and demonstrated. The manipulation of the various kinds of goods in the mill, viz.: all wool, shoddies, and mixed goods is studied in class room and by operation in the mill.

The changes in weight and strength for each operation are carefully considered as well as the value of the flocks made in each. A study of the various methods of flocking, such as dry and wet are considered in both class and machine rooms. In each operation the defects likely to materialize are studied as well as the causes thereof, and various methods of modifying or lessening them.

Washing and Speck Dyeing

This branch considers the scouring, rinsing and washing of goods both before and after the fulling process. The various types of washers and the details of construction, such as suds box, rolls, etc. The theory of scouring, uses of Fuller's earth, salt solutions, and sours, on the different kinds of goods is made clear by practical work in the

machine room, where the defects due to improper scouring such as stains, cloudy effects, wrinkles, unclean goods, etc., are demonstrated. The discussion of the necessity of speck dyeing follows naturally from the study of these matters and includes methods of preparation, materials used, application and tests required.

Carbonizing

This is an important branch of finishing and includes a study of the various carbonizing agents, methods of application, strength of solutions, neutralizing, etc., as well as the machines used. Stains and imperfections resulting from carbonizing are also considered. The drying and tentering machines and extractors employed are taken up at this point.

Gigging, Napping and Steaming

The construction in detail of the various types of gigs, nappers, steamers, wet gigs, rolling, stretching, crabbing and singeing machines is discussed and their actions upon the cloth and the results obtained are explained.

Various methods of obtaining lustre and the production of permanent finish are considered in connection with steaming and sponging.

Brushing, Shearing and Pressing

This includes as do the other branches a careful treatment of the machines employed, the preparation of the cloth for each process, the action of each machine in producing its part of the resultant effect. With the manipulation of the shear comes the matters of setting, grinding, and adjustment. With the brushing machine the effect of steaming and moisture upon the lustre and "feel" of the goods is shown. A study of the action of the presses both plate and rotary involves consideration of pressure, steaming, etc. Special processes to obtain particular effects are taken up and the part played by each machine is explained. The details involved in handling cloth on a commercial scale as for example measuring, weighing, ticketing, numbering, rolling, etc. are also explained. The necessary calculations and the methods of finishing all grades of goods are considered from time to time during the year.

Cotton Fabrics

Cloth Room

Inspection of the various goods and the object thereof. Construction of the various types of inspecting and trimming machines.

Shearing

The object. A consideration of the various types of shears for treating one or both sides at the same time, also the use of the usual cleaning devices such as, emery, sand, and card rolls, beaters, brushes, etc. Grinding and the adjustment of the various parts.

The use of brushing and cleaning machines, rolling devices, and calender attachments, for grey goods.

Singeing

Development and object of singeing. The construction of singers of all types, and for various purposes. The use of cooling tanks, steaming devices, rolling and brushing attachments.

Regulation of the flame for various goods and adjustment of the parts. Gas and air pressures, water cooled rolls. The effect of moisture on the cost of singeing, etc. The use of dry cans in connection with singeing. Electric singeing.

Washing

Open width and string washers. Their construction and operation. Soaps, Temperature, Squeeze rolls, etc. Washing of various goods and the object thereof. Stains.

Napping

The object of napping and the usual method of treating goods. Various types of nappers—Single—Double acting—Felting nappers, Construction, Grinding, and adjustment of various types.

Water Mangles

Their object and the construction of various types. Various rolls, iron, husk, etc. Scutchers, their object and construction.

Starch Mangles

The object and construction of all types of starch mangles for pure starch and filled goods. Various types of rolls, brass, rubber, wood. Action of doctor blades, etc. Regulation and object of pressure.

Methods of starching and finishing all standard goods, also a consideration of the various substances used, such as starch, softener, fillers, etc. The preparation of starch and various methods of application.

Dryers and Stretchers

Both horizontal and vertical, Tenter frames, Clips. The swing motion and the finishes thus produced. Construction. Spraying machines, belt stretchers, button breakers. Their object, construction.

Calenders

The object and construction of all types, including the regulation of pressure and nips for the production of various finishes. Various types of rolls and their use, steel, husk, and paper, etc. The use of hot and cold rolls. Chasing, friction, embossing and Schriener calenders, and the various finishes produced by each. Production of watered effects. Beetling machines.

Making up room—Yarding, Inspecting. Different types of folds. Pressing, papering, marking.

TEXTILE ENGINEERING DEPARTMENT

Elements of Mechanics and Mechanism

This subject is required by all courses and consists of ninety hours of lectures and recitations covering the whole of the first year. The fundamental principles of these subjects are considered of the greatest importance and the applications and problems are selected with special reference to their practical uses in textile machinery. The large variety of mechanism applications met in textile machines makes this course an essential one as a proper preparation for the student's later work in spinning and weaving. During the second term a short time is devoted to a study of the principles of applied mechanics including strength of materials. This work finds its applications in the later study of mill construction. Students in Course VI are also required to take fifteen additional hours on gearing. Some of the subjects treated in this course are:

Mechanics

Work, power and energy.
Principles of moments.
Simple and compound levers.
Inclined plane and wedge.
Screw and worm wheel.
Parallelogram of forces.

Mechanism

Classification of motions.
Belting problems
Gearing and gear trains.
Link motions.
Cams and cam design.
Differential and epicyclic trains.

Mechanism of Power Weaving

This course consists of thirty lectures covering both terms of the second year and is required by all the regular students taking power weaving. A thorough analysis of all the important motions of power weaving is undertaken and the treatment is by graphical and analytical methods. The object of this course is to so familiarize the student with the theory of the mechanism of the loom that the time spent in the weave room on loom fixing is used to the best advantage.

Mechanical Drawing

This course is taken by all regular students during the first term of the first year. The weekly program consists of one lecture and five hours in the drawing room. This subject is considered of the greatest importance as a preparation for the student's future work and the practical usefulness of drawing of this character is fully emphasized. The course is systematically laid out covering in order the following divisions:

- Care and use of drawing instruments.

- Geometrical constructions.

- Elements of projections and descriptive geometry.

- Isometric projection.

- Developments with practical applications.

- Sketching practice on machine details.

A certain portion of the time is also devoted to the solution of graphical problems in connection with the course in mechanism and mechanics.

Machine Drawing

This work is the continuation of the mechanical drawing and is pursued throughout the entire second term of the first year. This work is wholly of a practical character and includes sketching from textile machinery details, working scale detail and assembly drawing, tracing and blue printing. Students in Textile Engineering being assigned additional time in the drafting room are enabled in many cases to complete a full set of detail drawings for an entire machine. They are also given the rudiments of machine design to supplement the work in strength of materials and machine shop practice.

During the second year all regular students except those of Course IV spend a period of two and one-half hours per week on a series of advanced graphical mechanism problems. The data for all of these problems is in every case taken directly from some of the textile machines that the students meet in other departments. These problems include cam designs for builder motions, mule scroll layouts, scaife builder motion, fly frame cones, mule quadrant motion and a number of others of similar character.

Mill Engineering

This course consists of forty-five lectures and thirty hours of drawing room exercises and is taken by all regular students except those in Course IV, during the third year. This work covers a wide range of subjects and is of the most practical character possible. All of the student's previous work in mechanics, steam engineering, and his knowledge of textile processes is here brought together in the consideration of the larger problems of mill design and "organization." A detailed study is made of the most modern types of mill buildings, including all calculations and drawings. Practice is also given with the engineer's transit and level in the field in plane surveying, setting batters, etc. A considerable time is devoted to a study of the methods of power transmission and the proper arrangement of textile machinery. The problems are in every case taken from actual conditions of mills already built or in process of construction. In addition to the regular exercises the students of the Textile Engineering course are given fifteen additional lectures on steam power plant design and steam plant economies. They are also given a large amount of additional time in the drawing room, enabling them to work out nearly all the problems involved in the design of an entire mill plant. Lectures and problems are also given on other features of mill engineering such as mill heating, ventilation and lighting, humidification and fire protection.

Shop Practice

Systematic instruction is given in the most approved methods of machine shop practice, the object being to familiarize the student with the proper use of hand and machine tools and the characteristics of the different materials worked. Arrangements have been made with a local machine company of such a character as to give the work the greatest educational value and the important commercial element which stimulates the student's interest. Particular attention is given to the form, setting, grinding and tempering of tools and the mechanism of the different machines involving certain speeds, feeds, etc. The course is so planned that the instruction in each typical operation shall conform as nearly as possible to commercial machine shop practice on textile machinery. The list of tools given elsewhere in this bulletin gives an idea of the scope of the work which includes shipping and filing, tool grinding and tempering, straight and taper turning, screw cutting, drilling and boring, planer work, milling machine work, including gear cutting. Instruction is also given in use of wood working tools, both hand and machine and also in forging.

Steam Engineering

This course consists of forty-five lectures and is taken by all regular students during the second year. The purpose of this work is to familiarize the student with the essential elements of power generation and the

means and methods of modern practice in power engineering. The principal phenomena of heat finding application in the steam plant are first thoroughly studied. This is followed by the subjects of fuels, furnaces, stokers, boilers, engines, turbines, condensers and other important features of a steam plant. The lectures pertain mainly to the principles, proper operation and efficient performance of these units, while a standard text book supplies the matter descriptive of the construction details and the different types. Practice with the steam engine indicator, boiler and engine tests are also included in this work. Some time is also given to the study of the modern gas engine and its applications.

In addition to the above, students in Textile Engineering are given fifteen additional lectures, going more fully into the theoretical thermodynamic principles underlying these subjects. They also have opportunity for practical work in a large number of tests in the Engineering Laboratory. (See Engineering Laboratory).

Hydraulics

This subject is presented in a course of fifteen lectures covering the principles of hydraulics, including hydrostatics, measurements of flow of water through orifices, pipes, nozzles and over weirs. The different types of turbines are studied with results of tests and rating tables. Course VI students pursue this course to greater length, supplemented by experiments in the laboratory.

Electrical Engineering

This subject is conducted with the object of giving the students of all courses a general knowledge of the fundamental principles of electricity and magnetism together with the applications as they occur in the textile industry. The course commences with the second term of the second year and continues into the third year.

The instruction is given by means of lectures, recitations, and laboratory work and includes the subjects of Elementary Electricity, Magnetism, Electrical Units, Measuring instruments, Direct current machinery, Generators, Motors, Switch board design, Systems of Transmitting power by electricity, Electric lighting, Storage batteries, Electrolysis, etc. Following this is a discussion of Alternating Current phenomena, A. C. Generators, Motors, and other apparatus required in the generation and distribution of power by electricity.

Particular attention is given to the applications of electrical engineering in the textile industry and the modern methods of electric driving of textile machinery are made the basis of special study.

Students of Course VI pursue this subject to a greater extent and carry on considerable laboratory work in conjunction with the lectures and recitations.

Mathematics

The subject of Advanced Algebra is taken up by the first year students during the first term. This is presented by means of lectures, class and problem work, and includes the subjects of Theory of Exponents, Quadratic Equations, Ratio and Proportion, Variation, Arithmetical, Geometrical and Harmonical Progression, Undetermined Coefficients, Binomial Theorem, Permutations and Combinations, Graphical Representation and Solution of Equations.

The subject of Plane Trigonometry follows the Advanced Algebra in the last part of the first term and is completed during the second term. Several exercises at the end of this course are devoted to instruction and practice in the use of the slide-rule.

Analytical Geometry

This course commences in the first year and is continued into the second year by students of the Textile Engineering Course. The instruction is given by lectures and class work and considers the subject heads of Loci, Straight Line, Common System of Co-ordinates, Transformation of Co-ordinates. The Circle, Conic Section, Parabola, Hyperbola and Ellipse. These are considered in the reference to both Polar and Rectangular Co-ordinates.

Differential and Integral Calculus

This subject is taken by all Course VI students and extends throughout the third year. It is arranged with the aim to give the students a working knowledge of the subject and to present its application to many engineering problems.

Physics

The course of General Physics is required of all second year regular students. The instruction is given by means of lectures and laboratory work and includes the following subjects:—The Laws of falling bodies, Mass, Density, Momentum, Mechanics, Elementary Principles of Hydrostatics, Sound, which includes a study of the means of propagating and determining velocity of sound, Interference of Sound Waves, Reflection and Refraction of Sound, etc. Considerable time is devoted to the subject of Light in accordance with the modern theory concerning its propagation, measurements of velocity, analysis and interference. The application of laws of mirrors, lenses and prisms as found in the microscope, spectroscope, etc., and consideration of the physical laws underlying color and color effects receive special attention.

Laboratory work is given during the second and third years with the purpose of familiarizing the student with the apparatus available for making general physical measurements as well as special apparatus used in

testing textile materials. Particular attention is given to the method of making observations and the treatment and interpretation of the data so obtained.

Engineering Laboratory

This work is taken only by the students in the Textile Engineering Course during both terms of the second year. The following list of tests indicates*the character of the work which is carried on in the engineering laboratory and power plant:

Efficiency tests of chain block, jack screws, wedges, etc.

Calibration and use of differential dynamometer.

Determination of friction of belts.

Calibration of gauges, thermometers and indicators.

Use of different types of steam calorimeters.

Tests on motor driven ventilation fans.

Test of engine driven fan and heater.

Test on steam injector and steam pumps.

Triplex power pump tests.

Air compressor test.

Test on centrifugal pump.

Measurement of flow of water by orifices and weirs.

Corliss engine tests condensing and non-condensing.

Valve setting.

Tests from 10 to 24 hours on 300 Horse Power Aultman and Taylor or 200 Horse Power Stirling boilers.

Use of electrical measuring instruments for direct and alternating current.

Generator tests. Direct and alternating current.

Motor tests and calibration for power measurements on textile machinery.

Determination of calorific value of coal.

Chimney gas analysis.

Economy tests on 50 Horse Power gas engine.

The tests are taken up in systematic manner and are timed to follow as nearly as possible the lectures and recitations on the same topic.

SCHOOL ADMINISTRATION

CHARLES H. EAMES, S. B., principal of school. Massachusetts Institute of Technology, 1897. Experience: secretary of the school, and instructor in electrical engineering and mathematics. Superintendent, Light, Heat and Power Company, Lowell, and engineer with Stone & Webster, electrical engineers, Boston, Mass.

INSTRUCTORS

TEXTILE ENGINEERING

GEORGE H. PERKINS, S. B., chief instructor. Massachusetts Institute of Technology, 1899. Associate member American Society of Mechanical Engineers. Experience: draftsman, Ludlow Manufacturing Company, Ludlow, Mass.; Lockwood, Greene & Co., Boston, Mass.

HERBERT J. BALL, S. B., instructor in mechanical engineering. Massachusetts Institute of Technology, 1906.

ULYSSES J. LUPIN, S. B., instructor in mathematics, physics and electrical engineering. Lawrence Scientific School, 1906. Experience: draftsman, General Electric Company, Lynn, Mass.; with Winston Company, Metropolitan Water Board.

FELIX D. LANGEVIN, part time instructor in machine shop practice. Lowell Textile School, 1904. Assistant superintendent, Kitson Machine Shop, Lowell, Mass.

CHEMISTRY AND DYEING

LOUIS A. OLNEY, A. C., M. S., chief instructor and professor of chemistry. Lehigh University, 1896. Experience: instructor, Brown University; consulting chemist for Lowell Machine Shop and Lowell Gas Light Co., Dyeing and Finishing Departments, Stirling Mills, Lowell, Mass.

JOHN B. REED, A. B., instructor in chemistry. University of Michigan, 1903. Experience: instructor in chemistry, University of Maine.

WALTER B. POPE, B. S., instructor in chemistry. Worcester Polytechnic Institute, 1903. Experience: assistant chemist, State Laboratory of Hygiene, Concord, N. H.; chemist in charge of Food Laboratory, Fargo, N. D.

ROBERT R. SLEEPER, instructor in dyeing. Lowell Textile School, 1900. Experience: Read, Holiday & Sons, Limited, New York City; H. A. Metz & Co., New York City.

GEORGE A. CUSHMAN, A. M., instructor in chemistry and English. A. B., Harvard College, 1906; A. M., 1907.

GEORGE W. HATHORN, instructor in dyeing. Lowell Textile School, 1907. Experience, New England Gas and Coke Co., Everett, Mass.

WALTER E. HADLEY, instructor in chemistry. Lowell Textile School, 1908.

DECORATIVE ART

- EUGENE W. CLARK, JR., chief instructor. Honor graduate, School of Design, Boston Museum of Fine Arts, 1904. Architectural experience: Little & Browne, Boston, Mass.; George H. Ingraham, Boston, Mass.
- ELIZABETH WHITNEY, instructor in freehand drawing. Normal Art School, Boston, 1882. Pupil of Dr. Denman W. Ross, lecturer in design, Harvard University. Experience: teaching, fifteen years.

TEXTILE DESIGN AND POWER WEAVING

- FENWICK UMPLEBY, chief instructor. Professor of textile design and fabric structure. Honor graduate, textile department, Victoria College, Leeds, Eng., 1884. Experience: James Lees & Sons, Bridgeport, Pa.; chief designer, Geo. H. Gilbert Manufacturing Company, Gilbertville, Mass.; and Globe Manufacturing Company, Utica, N. Y.
- ARTHUR F. FERGUSON, instructor in textile design and cloth analysis. Lowell Textile School, 1903. Experience: Chapman, Kendal & Daniels, wholesale dry goods, Boston, Mass.
- STEWART MACKAY, instructor in hand loom weaving. Lowell Textile School, 1906.
- JOSEPH WILMOT, instructor in power weaving and warp preparation. Lowell Textile School, 1908. Experience: loom fixer, U. S. Bunting Company, Lowell, Mass.
- ALBERT E. MUSARD, instructor in Jacquard weaving. Experience: Oldham Mills, Philadelphia, Pa., and Paterson, N. J.; Gloucester Rug Mills, Gloucester City, N. J.; Binder & Ellis, Philadelphia, Pa.
- JOHN R. WALMSLEY, instructor in cotton power weaving. Experience: Pierce Manufacturing Company, New Bedford, Mass.

COTTON YARN

- STEPHEN E. SMITH, chief instructor. Lowell Textile School, 1900. Experience: draftsman, Lowell Machine Shop, Lowell, Mass.; Atlantic Cotton Mills, Lawrence, Mass.; Shaw Stocking Company, Lowell, Mass.
- JAMES G. COMAN, B. Sc., instructor in cotton yarns. B. Sc., Mississippi A. and M. College, 1904; Lowell Textile School, 1907. Experience: Meridian Cotton Mills, Meridian, Miss.; Whitin Machine Works, Whitinsville, Mass.

WOOLEN AND WORSTED YARNS

- EDGAR H. BARKER, chief instructor. Massachusetts Institute of Technology, 1896. Experience: Pacific Mills, Lawrence, Mass.; E. Frank Lewis, Lawrence, wool scouring.
- JOHN N. HOWKER, instructor in wool sorting and scouring. Technical School of Saltaire, near Bradford, Eng.; certificate from City and Guilds of London. Experience: Saltaire Mills, Yorkshire, Eng.; Goodall Worsted Company, Sanford, Me.; Arlington Mills, Lawrence, Mass.
- HENRY H. CROMPTON, instructor in worsted yarns. Lowell Textile School, 1899. Experience: Arlington Mills, Lawrence, Mass.
- EUGENE C. WOODCOCK, instructor in woollen yarns. Lowell Textile School, 1907. Experience: Wood Worsted Mills, Lawrence, Mass.

FINISHING

ARTHUR A. STEWART, chief instructor. Lachine Academy, Canada; Lowell Textile School, 1900. Experience: Dominion Woolen Manufacturing Company, Montreal, Can.; American Woolen Co. Mills; Nonantum Worsted Mills, Newton, Mass.; instructor, woolen and worsted yarns, Lowell Textile School.

LANGUAGES

PAUL E. KUNZER, Ph. D., instructor in commercial languages. Ph. D., Berlin University, 1887. President New England College of Languages, Boston, Mass.

FREDERICK A. WOOD, Ph. D., instructor in History. Ph.D., Columbia University, Economics, 1894. A. B., Dartmouth College, 1886.

ALUMNI ASSOCIATION

The Alumni Association of the School holds its annual meeting and banquet in Lowell on commencement day.

The membership of the Association is restricted to graduates of the day school. Honorary membership is open to the Board of Trustees, the Faculty and such others as may be elected by the Association.

The officers for year ending June, 1909 are :

President:	William H. Wingate, '08
Vice-President:	Arthur J. Hennigan, '06
Sec.-Treasurer:	Arthur A. Stewart, '00

Board of Directors: The President, Vice-President, Secretary-Treasurer, Henry A. Bodwell, '00, for one year, and Stephen E. Smith, '00, for two years. Communications should be addressed to Arthur A. Stewart, Lowell Textile School.

THE SOUTHWICK TEXTILE CLUB

The object of the Club is to promote the welfare of the School and the social and intellectual interests of its past students.

The membership is restricted to all persons who have attended the day classes of the School for at least one year and who are not, at the time of making application to the Club, students thereof.

The Club was organized on February 23, 1907, and at present has about seventy-five members. The officers of the Club are:

President:	Royal P. White, '04
Vice-President:	Arthur C. Varnum, '06
Sec.-Treasurer:	Arthur A. Stewart, '00

Executive Board: President, Vice-President, Secretary-Treasurer, Henry A. Bodwell, '00, and Stephen E. Smith, '00.

DAY CLASS OF 1908

Graduates with Titles of Theses

Diplomas awarded as follows, June 4, 1908:

- | | | |
|---------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|
| George Richard Abbott, | Wool Manufacturing,
"The Uniformity of Twist at Different Stages
of Building of a Warp Bobbin." | Andover, Mass. |
| Horace W. C. S. Ballard, | Chemistry and Dyeing,
Thesis with W. H. Wingate.
"An Investigation of the Comparative Fastness
of the Natural, and Coal-tar Coloring Matters." | Marblehead, Mass. |
| John Francis Dwight, Jr., | Wool Manufacturing,
Thesis with L. S. Farr, O. D. Gay.
"The Manufacture of a Fancy Worsted." | Dorchester, Mass. |
| Leonard Schaefer Farr, | Wool Manufacturing,
Thesis with J. F. Dwight, Jr., O. D. Gay. | Holyoke, Mass. |
| Olin Dow Gay, | Wool Manufacturing,
Thesis with J. F. Dwight, Jr., L. S. Farr. | Cavandish, Vt. |
| Walter Eastman Hadley, | Chemistry and Dyeing,
"A Study of the Methods in use for the Determination
of the Fastness of Dyestuffs to the Common Color Destroying Agencies." | Lowell, Mass. |
| Geronimo Huerva Huising, | Cotton Manufacturing,
"The Effect of Spindle Speed and Draft upon the
Evenness and Strength of a Cotton Yarn." | Philippine Islands |
| Leland Aldrich Jenckes, | Textile Engineering,
"A Comparison of the First Costs of the Transmission
Equipment of a Mechanically and Electrically Driven Mill." | Dorchester, Mass. |
| LeRoy Clark Lewis, | Chemistry and Dyeing,
"Dyeing of Leather." | North Woburn, Mass. |
| Howard Twisden Mailey, | Wool Manufacturing,
Thesis with F. B. Reynolds.
"A Comparison of Worsted Mule and Cap Spun Yarn." | Lynn, Mass. |
| Joshua Dean Perkins, | Textile Designing,
"Color Effects in Tapestry Weaving." | East Bridgewater, Mass. |
| Sylvanus Cushing Prince, | Textile Engineering,
"Calibration of a Direct Current Motor and Tests on
a Motor Driven Spinning Frame." | Lowell, Mass. |
| Braman Proctor, | Chemistry and Dyeing,
"Comparative Fastness of the Reduction Vat Colors,
with other Coal-tar Dyestuffs producing Corresponding Colors." | Wrentham, Mass. |
| Fred Bartlett Reynolds, | Wool Manufacturing,
Thesis with H. T. Mailey. | North Andover, Mass. |
| Ernest Warren Robinson, | Chemistry and Dyeing
Thesis with W. E. Weinz.
"An Investigation of the Value of Formic Acid as an
Adjunct in Various Textile Coloring Processes in Comparison with
other Similar Substances, ordinarily used." | Haverhill, Mass. |
| William Elliot Weinz, | Chemistry and Dyeing,
Thesis with E. W. Robinson. | Roxbury, Mass. |
| William Henry Wingate, | Chemistry and Dyeing,
Thesis with H. W. C. S. Ballard. | Lawrence, Mass. |

REGISTER OF DAY STUDENTS

1908-1909.

Third Year

Name	Course	Address
Boyd, William	II	North Adams, Mass.
Brainerd, Arthur T.	IV	Bradford, "
Bunce, Raymond H.	Sp. III	North Adams, "
Burns, William M.	IV	Arlington, R. I.
Coburn, Clarence E.	I	Lowell, Mass.
Collingwood, Hueston	Sp. III	Plymouth, "
Conant, Harold W.	I	Littleton Common, "
Fairbanks, Almonte H.	II	Wakefield, "
Ferguson, William G.	III	Springvale, Me.
Fiske, Starr H.	II	Winthrop, Mass.
Fitzpatrick, William J.	VI	Brookline, "
Gray, Robert C.	Sp. III	Lawrence, "
Gyzander, Arne K.	IV	Wilmington, "
Holden, Francis C.	IV	Lawrence, "
Huising, Geronimo H.	VI	Jaro, Iloilo, P. I.
Kay, Harry P.	II	Oxford, Me.
Laughlin, James K.	III	East Greenwich, R. I.
Levi, Alfred S.	IV	New York City
Mason, Archibald L.	VI	Billerica, Mass.
MacPherson, John R.	IV	North Adams, "
McCarthy, Frederick G.	IV	Haverhill, "
Mullen, Arthur T.	II	Dorchester, "
Newall, J. Douglas	IV	Lawrence, "
Parkis, William L.	I	Whitinsville, "
Pease, Chester C.	I	Lowell, "
Potter, Carl H.	I	Ludlow, "
Prescott, Walker F.	IV	Lawrence, "
Sanborn, Waldo H.	IV	" "
Saunders, Harold F.	IV	Andover "
Smith, Harry M.	IV	New Hartford, Conn.
Stone, Ira A.	IV	Beachmont, Mass.
Valpey, Frank D. R.	VI	Lawrence, "
Webber, Marcus B.	VI	Bedford, "
Westcott, Charles A.	I	Hopedale, "
Wood, J. Carleton	IV	Haverhill, "

Second Year

Anderson, William	VI	Andover, Mass.
Arienti, Peter J.	IV	Great Barrington, "
Bean, Arthur E.	IV	Haverhill, "
Blaikie, Howard M.	II	Medford, "
Brady, John T., Jr.	II	Albany, N. Y.
Bragg, Harold N.	IV	Medway, Mass.
Canty, Timothy A.	Sp. III	Reading, "
Cary, Julian C.	VI	Lowell, "
Clark, Thomas T.	II	North Billerica, "
Deely, John A.	Sp. III	Pittsfield, "

Name	Course	Address
Donovan, Michael R., Jr.	III	Lynn, Mass.
Duval, Joseph E.	II	Jamaica Plain, "
Finlay, Harry F.	IV	Lawrence, "
Fletcher, Roland H.	VI	Littleton Common, "
Gale, Harry L.	III	Cambridge, "
Goldberg, George	VI	Malden, "
Hale, Elliott K.	Sp. III	Lawrence, "
Hardy, Philip L.	VI	Andover, "
Howe, Woodbury K.	I	Groton, "
Hurtado, Leopoldo, Jr.	VI	Mexico City, Mexico
Jeffrey, William G.	Sp. III	Reading, Mass.
Jelleme, William O.	I	Passaic, N. J.
Keough, Wesley L.	II	Winthrop, Mass.
Kono, Hidesburo	I	Ozu-machi, Ehime-ken, Japan
Lamb, Arthur F.	II	Rockland, Me.
Leck, Arthur J.	Sp. III	Lawrence, Mass.
Manning, Frederick D.	IV	Fitchburg, "
Martin, Lucius T.	II	New York City
McCool, Frank L.	IV	Mansfield, Mass.
Michelson, Harold G.	I	Newark, N. J.
Morton, John R.	IV	Jamaica Plain, Mass.
Murray, James A.	II	Somerville, "
Nettel, Franck C.	Sp. III	Manchester, N. H.
Nichols, Raymond E.	VI	Wakefield, Mass.
O'Connell, Clarence E.	IV	Andover, "
O'Riordan, Andrew	VI	Lowell, "
Putnam, Leverett N.	IV	Danvers, "
Ray, James F.	Sp. III	Greenwich, Conn.
Reed, Norman B.	I	Malden, Mass.
Robson, Frederick W. C.	IV	Lowell, "
Smith, Doane W.	II	Westfield, "
Smith, Theophilus G., Jr.	IV	Groton, "
Stronach, Irving N.	IV	Lowell, "
Sutcliffe, John W.	I	Atlanta, Ga.
Vinal, Willis R.	II	Warren, Me.
Walker, Alfred S.	II	Malden, Mass.
Watson, William	III	Haverhill, "
Whelan, Francis T.	Sp. III	Lowell, "
Whitcomb, Roscoe M.	IV	Winchester, "
Whitney, Austin P.	I	Leominster, "
Winslow, George H.	Sp. III	Norwood, "
Wood, Ernest H.	IV	Andover, "

First Year

Adams, Tracy A.	IV	East Bridgewater, Mass.
Anagnos, Demetrius	I	Lowell, "
Bailey, Walter J.	IV	Watertown, "
Burke, John W.	IV	Amesbury, "
Burnham, George W.	Sp. IIIb	Nashua, N. H.
Cameron, Elliott F.	IV	Beverly, Mass.
Chandler, Proctor R.	IV	North Andover, "
Cheney, Henry S.	I	Clinton, "
Chisholm, Lester B.	I	Melrose Highlands, "
Connelly Charles F.	—	Somerville, "

Name	Course	Address
Culver, John H.	IV	Groton, Mass.
Dewey, Maurice W.	II	Montpelier, Vt.
Edmands, Frederick P.	I	Hingham, Mass.
Elliot, Gordon B.	II	Grafton, "
Estey, Paul F.	IV	Gardner, "
Ferguson, Eva B.	Sp. IIIb	Lowell, "
Ferrin, George K.	Sp. III	Lowell, "
Flynn, Thomas P.	IV	Fitchburg, "
Ford, Edgar R.	IV	Lawrence, "
Gainey, Frank W.	IV	" "
Gonzalez, Emilio J.	I	Jaro, Iloilo, P. I.
Goodwin, James S.	III	Amesbury, Mass.
Harrison, Henry H.	I	Reading, "
Hay, Ernest C.	II	Pittsfield, "
Hendrickson, Walter A.	II	Wakefield, "
Hodecker, John N.	IV	Adams, "
Hodgkins, Albert A.	Sp. III	Augusta, Me.
Hubbard, Ralph K.	IV	Norwood, Mass.
Huegin, Kurt	IV	Winchester, "
Hundley, James W.	I	Baltimore, Md.
Huntington, Paul O.	IV	Ayer, Mass.
Hunton, John H.	II	Newport, N. H.
Jack, Charles H.	VI	Manchester, "
Jefferson, Roswell C.	IV	Lowell, Mass.
Kehew, Walter E.	IV	Somerville, "
Keith, Roy L.	I	Millford, N. H.
Lewis, Stanley W.	—	Cincinnati, Ohio
Lipton, Benjamin	VI	Malden, Mass.
Lontz, Harry R.	—	Richmond, Ind.
Mabbett, Albert L.	Sp. III	Newport, Me.
Manship, Nelson A.	VI	Brookline, Mass.
Marland, Harold W.	VI	Andover, "
Martin, Harry W.	IV	Marblehead, "
McGowan, William J., Jr.	IV	Woburn, "
McKinnon, Duncan C.	—	Lowell, "
Merrill, Allan B.	IV	Lynn, "
Middleton, James A.	IV	Ripon, Wis.
Moore, Karl R.	IV	Newton Highlands, Mass.
Morris, Joseph P.	III	Utica, N. Y.
Mudge, Gordon	Sp. III	Lynn, Mass.
Murphy, Howard H.	VI	Boston, "
Murray, Walter R.	I	Melrose, "
Neelon, Raymond V.	IV	Medway, "
Newell, Carroll D.	IV	Winchester, "
Noyes, Philip A.	III	Haverhill, "
Oehme, Fred W.	II	Worcester, "
O'Hara, Benjamin F.	IV	Lowell, "
O'Mahoney, Joseph V.	II	Lawrence, "
Outwater, John R.	I	Passaic, N. J.
Pearson, Alfred H.	IV	Springvale, Me.
Phillips, Fred T.	IV	Lynn, Mass.
Reid, George B.	—	Holyoke, "
Rich, Everett B.	III	Worcester, "
Scribner, Paul A.	II	North Chelmsford, "
Searle, David H.	IV	Chelmsford, "
Sidebottom, Leon W.	IV	Lowell, "

Name	Course	Address
Signor, Clarence E.	IV	Worcester, Mass.
Skilton, Frederick E.	IV	Somerville, "
Standish, John C.	IV	Dighton, "
Stebbins, Joseph B.	II	South Deerfield, "
Stratton, Rodney W.	II	North Adams, "
Summersby, George W.	I	Lawrence, "
Swett, Esther M.	Sp. IIIb	Boston, "
Thaxter, Joseph B., Jr.	II	Hingham, "
Tilden, Harry W.	—	Roxbury, Vt.
Toshach, Reginald A.	II	Methuen, Mass.
Welch, Georges C.	I	Stoughton, "
White, Alice L.	Sp. IIIb	Lowell, "
White, Howard A.	VI	Ayer, "
Wiley, Raymond	IV	Somerville, "
Williams, Harrison M.	II	Haverhill, "

Specials

Bailey, Carl E.	—	Lowell, Mass.
Chow, Chun K.	IV	Honolulu, Hawaiian Islands
Connors, Edward F.	VI	Lowell, Mass.
Cuttle, Francis G.	I	" "
Doyle, Thomas W.	VI	" "
Garland, Charles P.	—	Saco, Me.
King, Walter W.	IV	New Brighton, Staten Island, N. Y.
Manrique, Francisco J.	—	Lowell, Mass.
Varnum, Percy E.	VI	" "

REGISTER OF EVENING STUDENTS

1908-1909

EXPLANATORY NOTE

Course I	Cotton Spinning
Course II (a)	Woolen Spinning
Course II (b)	Worsted Spinning
Course III	Designing
Course IV	Chemistry and Dyeing
Course V (a)	Cotton Weaving
Course V (b)	Woolen and Worsted Weaving
Course V (c)	Dobby and Jacquard Weaving
Course VI (a)	Mechanics
Course VI (b)	Mechanical Drawing
Course VI (c)	Architectural Drawing
Course VI (d)	Freehand Drawing
Course VI (e)	Machine Shop
Course VII	Woolen and Worsted Finishing

POST GRADUATE

Name	Course	Address
Bake, Herbert	III	Methuen, Mass.
Brown, James T.	III	Lowell, "
Hanson, Edward	III	" "
Molloy, Andrew	III	" "
Saalfrank, Joseph C.	III	" "
Smith, Arthur	III	Lawrence, "
Smith, Wm. E.	III	" "
Spurr, James H., Jr.	IV	" "
Stopherd, Wm. H.	III	Lowell, "

FOURTH YEAR

Anderson, Carl A.	IV	Lowell, Mass.
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THIRD YEAR

Abbott, Paul W.	VIa	Lowell, Mass.
Aitken, Alexander	VIa	" "
Ansart, Arthur G.	VIa	" "
Arnold, Warren H.	III	" "
Bell, Willie	VIa	" "
Benoit, Benjamin L.	VIb	" "
Booth, Arthur	III	Methuen, "
Bowen, Herbert E.	III	Lowell, "
Butler, Elizabeth M.	VIa	" "
Christison, Hugh	IV	Methuen, "
Cockell, Frederick H.	III	Lawrence, "
Davis, Nathaniel B.	IIb	Lowell, "
Delany, John A.	VIa	" "
Dulligan, Charles E.	VIa	" "
French, George E.	VIa	" "
Gaunt, Ernest H.	III	Methuen, "
Gilinson, Philip J.	VIa	Lowell, "

Name	Course	Address
Gleekman, Morris	VIb	Lawrence, Mass.
Goodchild, George	I	Lowell, "
Gordon, Herbert E.	III	Methuen, "
Green, Henry F.	VIb	Lowell, "
Hill, Harold	I	Methuen, "
Hillier, Arthur P.	IIb	No. Chelmsford, "
Holt, Harry C.	VIa	Lowell, "
Houston, Wm. I.	III	Lawrence, "
Jordan, Frederic W.	IV	Lowell, "
Kaler, Harold F.	VIb	" "
Kelley, Bernard J., Jr.	VIc	" "
Knowles, Frank E.	I	" "
Lesuer, Clarence E.	VIa	" "
Lincoln, Francis J.	VIa	" "
Lincourt, Henry E.	VIb	" "
Maker, Isaac A.	I	" "
McLay, John	IIb	Lawrence, "
MacRitchie, Donald	VIc	Lowell, "
Mullen, Albert	VIb	" "
Nesbitt, Hedley G.	VIc	Lawrence, "
Orrell, Frank L.	VIb	Lowell, "
Paquin, Joseph	VIa	" "
Parsons, Joseph G.	III	" "
Pearson, Fred	VIa	" "
Perkins, Thomas, Jr.	I	" "
Peterson, Albert E.	VIa	" "
Quimby, Henry F.	VIa	" "
Redman, H. Stewart	IV	" "
Schubert, George J.	III	Lawrence, "
Schuerfeld, Harry W.	III	Dorchester, "
Stewart, Wm. W.	IV	Lawrence, "
Stocks, Carl W.	VIa	Lowell, "
Stott, Samuel	IV	Lawrence, "
Swanson, Anton W.	VIa	No. Billerica, "
Sykes, Alvin E.	VIa	Lowell, "
Tanner, George B.	VIa	" "
Tucker, John T.	I	" "
Vogt, Alfred	IIb	Lawrence, "
Ware, Edward W.	III	Dorchester, "
Watson, Luther F.	IIb	Methuen, "
Weigel, Frederick	VIb	Lawrence, "
Whitney, Frederick A.	IV	Lowell, "
Wood, Herbert C.	I	" "
Wright, Duncan	IIb	" "

SECOND YEAR

Abbott, Paul W.	VIa	Lowell, Mass.
Bailey, Carl E.	I	" "
Brien, Erastus	VIa	" "
Burgess, Joseph H.	III	Methuen, "
Butterfield, Maurice A.	VIb	Lowell, "
Campbell, Gaston E.	VIc	" "
Campos, Guy J.	III	" "
Carter, Harry L.	VIb	" "
Cox, Edward J.	III	" "

Name	Course	Address
Daggett, Earle V.	VIa	Lowell, Mass.
Davis, Nathaniel B.	IIb	" "
Dennis, George A.	VIa	" "
Dudley, Alexander J.	IIb	Andover, "
Dulligan, Lawrence	VIa	Lowell, "
Dulligan, Thomas	VIa	" "
Dunning, Carlos W.	VIb	" "
Elston, Frank, Jr.	III	Methuen, "
Fisher, Frederick L.	III	" "
Fitzgerald, Frank A.	III	" "
Flaherty, Wm.	III	Lowell, "
Gallagher, John F.	VIb	" "
Gasper, Edith E.	VIa	" "
Green, Frank L.	I	" "
Haggerty, John M.	VIa	" "
Heaton, Forster G.	IV	No. Andover, "
Hering, Paul C.	III	Methuen, "
Hill, Ellsworth O. C.	IIb	Lawrence, "
Hilliard, Wm. B.	VIa	Lowell, "
Hillidge, Michael S.	VIa	" "
Jean, Adhemard C.	VIa	" "
Jepson, Harry	III	" "
Jorde, Linville T.	VIc	" "
Kershaw, Samuel S.	IIb	No. Chelmsford, "
Laycock, Frank E.	IIb	Lowell, "
Ledoux, Blanche H.	VIa	" "
Lesuer, Clarence E.	VIa	" "
Logan, George H. S.	IV	Lawrence, "
Maxey, Leo M.	VIc	Lowell, "
McAuliffe, Patrick	VIb	" "
McClure, Charles G.	VIb	" "
McMahon, Edward F.	VIa	" "
Milot, Joseph E.	VIc	" "
Moreau, Arthur J.	III	" "
Musard, Albert E.	III	" "
Nelson, Ernest H.	I	" "
O'Brien, Thomas M.	VIc	" "
Paquin, Joseph	VIb	" "
Patterson, Charles L.	IIb	Lawrence, "
Peterson, Albert E.	VIa	Lowell, "
Petterson, Birger	VIa	" "
Phelps, Mary I.	VIa	" "
Polk, Roy A.	VIa	" "
Prevost, Ernest R.	VIa	" "
Price, Harold	VIb	" "
Robinson, Thomas	I	" "
Rogers, Carl H.	VIa	" "
Root, Frank, Jr.	III	" "
Ryan, Edward	I	" "
Sullivan, Humphrey F.	I	" "
Sullivan, Michael F.	VIb	Dracut, "
Varnum, Percy E.	VIc	Lowell, "
Walker, Kirke W.	VIa	" "
Walsh, Michael L.	I	" "
Weiss, Wm. P.	IIb	Lawrence, "
Welch, Benjamin L.	VIb	Lowell, "
Wright, Duncan	IIb	" "

FIRST YEAR

Name	Course	Address
Ackroyd, Gilbert	VIa	Lowell, Mass.
Aiken, Thomas	Va	" "
Allard, Henry L.	VIa	" "
Anagnos, Demetrius	I	" "
Anderson, Alex. C.	VII	" "
Anderson, Fred O.	VIa	" "
Ansart, George F.	VIa	" "
Archambault, Annette	VIId	" "
Axon, James N.	VIa	" "
Axon, William	VIa	" "
Bailey, Rothwell	Va	" "
Ballinger, Wm. E.	IIb	No. Chelmsford, "
Banks, Jonas	Va	Lowell, "
Barlow, Robert	III	" "
Barnes, Joseph	IV	" "
Barry, John J.	IV	" "
Bates, Charles	IIb	" "
Bean, Morton	VIa	" "
Bell, Frederick W.	VII	No. Billerica, "
Bell, Willie	VIa	Lowell, "
Birkby, Charles H.	IV	" "
Bishop, Carl A.	VIb	" "
Blake, Chester A.	VIb	" "
Booth, Hamlet L.	IIb	" "
Booth, Robert D.	Va	" "
Boutilier, Walter H.	VIa-b	" "
Bowen, Allyn F.	VIa	" "
Boyd, Robert	VIe	" "
Boyle, Wm. A.	VIa	" "
Brady, Frederick W.	IV-VIc	" "
Brady, John T., Jr.	III	" "
Brett, Thomas	IIb	" "
Brin, Arsene	VIa	" "
Broadbent, James H.	III	" "
Brouillette, Delphis	VIb	" "
Brown, William	VIa	" "
Brown, William F.	VIb	" "
Brunelle, Elodie	VIId	" "
Buckley, Richard	Vb	" "
Bunce, Raymond H.	Vb	" "
Burns, Wm. M.	VII	" "
Butterfield, Maurice A.	VIa	" "
Butterworth, Arthur	IV	" "
Callary, James J.	I	" "
Campbell, Andrew W.	IV	" "
Carden, Francis E.	VIa	" "
Carlson, Frank W.	VIa	" "
Carman, William	Va	" "
Carpilio, John A.	VIa	Lawrence, "
Carr, Verne C.	VIa	Lowell, "
Carter, George	VIe	" "
Caswell, Glen B.	VIa	Collinsville, "
Cayer, Albert	VIc	Lowell, "
Chadwick, Walter	VIe	" "
Chandonnet, Henry	VIe	" "

Name	Course	Address
Chapdelaine, Alonzo E.	VIa	Lowell, Mass.
Chaplin, Fred	VIc	" "
Chesworth, Frank K.	Va	Lawrence, "
Christian, Henry J.	VIa	Lowell, "
Cinqmars, Diana	VIId	" "
Clark, Ralph L.	IV	" "
Clark, Thomas	VIa	" "
Clark, Thomas E.	VIId	" "
Clark, Thomas T.	IIb	No. Billerica, "
Cochrane, John	VIb	Lowell, "
Collins, Frank J.	III	" "
Conley, William J.	VIa	" "
Connors, Edward F.	I	" "
Conway, Thomas	IV	" "
Corr, Eben	VIc	" "
Corr, James F.	III	" "
Cote, Charles R.	VIa	" "
Cote, George W.	VIb	" "
Cowdrey, Charles E.	Vb	No. Billerica, "
Crosby, Wesley R.	VIa	Dracut, "
Cudworth, James A., Jr.	VIa	Lowell, "
Cutress, Albert J.	VIe	" "
Daggett, Earle V.	VIa	" "
Daley, John T.	IV	" "
Daly, Bernard	Vb	" "
Dana, Clarence A.	I	" "
D'Anjou, Emma	VIId	" "
D'Anjou, Julia	VIId	" "
Davenport, Joseph	Va	" "
Davidson, Samuel H.	II	" "
Davison, Frank L.	Vb	No. Billerica, "
Dawson, James	VIa	Lowell, "
Deely, John A.	IV	" "
Dennis, George A.	VIa	" "
DeRoehn, Frank	VIa	" "
Devine, John J.	VIa	" "
Dixon, Frank H.	VIb	Collinsville, "
Dobbs, Willie	VIb	Lowell, "
Dodge, Charles P.	IV	" "
Donovan, James G.	IV	" "
Donovan, Michael R., Jr.	IV	" "
Doole, John T.	IV	" "
Dooley, Joseph	VIa	" "
Dooley, Thomas F.	VIa	" "
Dowd, Thomas J.	IV	" "
Dozois, Emilie M.	VIId	" "
Dozois, Henry	VIa	" "
Dunn, George C.	IV	" "
Durrell, Pearl T.	VIa	" "
Dwyer, John H.	VIe	" "
Edwards, Henry G. W.	IV	" "
Egan, Charles H.	VIId	" "
English, James A.	VII	Methuen, "
Entwistle, James A.	Vb	Lowell, "
Estabrook, Harry G.	VIa	Nashua, N. H.
Fader, Weldon L.	VIa-b	Lowell, Mass.

Name	Course	Address
Fair, Walter	VIa	Lowell, Mass.
Farley, John	VIa	" "
Farrell, Samuel T., Jr.	IIb	" "
Flemings, Lester A.	I	" "
Fletcher, Carl E.	VIa	" "
Flynn, John	VIe	" "
Flynn, Wm. J.	VIa	" "
Ford, Alvin M.	VIa-b	Lawrence, "
Fox, Russell M.	I	Lowell, "
Freeman, Ralph W.	VIa	" "
Fujiyoshi, Heisayu	I	" "
Furbush, Leroy C.	VIb	Lawrence, "
Gakidis, Alexander N.	IV	Lowell, "
Gallagher, Henry F.	VIb	Dracut, "
Gallagher, John F.	VIa	Lowell, "
Gannon, James H.	VII	No. Billerica, "
Garmon, George R.	VIb	Lowell, "
Garvey, Daniel	VIa	" "
Gaudette, Wilfred J.	VIa	" "
Goyette, George	VIa	" "
Gibbons, George P.	VIa	" "
Giles, William H.	VII	" "
Gillespie, Wm. L.	VIb	" "
Gillet, Charles C., Jr.	IV	" "
Gleekman, Morris	VIa	Lawrence, "
Glennon, Edward M.	IV	" "
Golden, Wm. A.	Vb	Lowell, "
Gonzalez, Emilio J.	Vb	" "
Goodchild, George	IIb	" "
Gookin, Alice L.	VIb	" "
Greene, James B.	VIe	" "
Grouke, John	IIb	" "
Guiney, John P.	VIa	" "
Guthrie, Daniel	Vb	" "
Haggerty, Francis J.	VIb	" "
Haggerty, Timothy S.	VIb	Ballardvale, "
Hale, Elliott K.	I	Lowell, "
Hannon, George W.	VIa	No. Billerica, "
Hardy, Maude	VIb	Lowell, "
Hartwell, Marcus H.	I	" "
Hayes, Benjamin F.	VII	Collinsville, "
Hayes, Charles	IIa	No. Billerica, "
Hayes, John	VIa	" "
Herdegen, Charles	I	Lawrence, "
Herron, Alexander T.	III	" "
Hession, Stephen C.	VIb	Lowell, "
Hill, Ellsworth O. C.	IIb	Lawrence, "
Hill, Harold	Va	Methuen, "
Hill, Percy	III	" "
Hillidge, Michael S.	VIa	Lowell, "
Hird, Arthur W.	I	" "
Hird, James A.	IV	" "
Hodgkins, Albert A.	VII	" "
Hogg, Frank H.	IIa	" "
Holt, Harry C.	VIc	" "
Howell, Edward	Va	Lawrence, "

Name	Course	Address
Hoyt, Newell A.	IV	Lowell, Mass.
Huising, Geronimo H.	IIa	" "
Hurley, Bernard	I	" "
Hurtado, Leopoldo, Jr.	IV	" "
Ingram, George E.	IIb	Lawrence, "
Jarvis, Charles	VIa	Andover, "
Jasper, Joseph C.	IV	Lowell, "
Jean, Adhemard C.	VIa	" "
Johnson, August	VIa	East Chelmsford, "
Johnson, Charles A.	IV	Lawrence, "
Johnson, Maurice	VIb	Lowell, "
Johnston, James W.	VIa	" "
Joyce, John P.	Vc	" "
Keairns, Wm. J.	VIa	" "
Kelleher, Wm. P.	VIa	" "
Kelley, Patrick	I	" "
Kennedy, Wm. E.	VIa	Lawrence, "
Kenney, Wm. M.	Vb	Lowell, "
Keronac, Leo A.	VIId	" "
Kershaw, Benjamin	Va	" "
Kinney, Pearl R.	VIa	" "
Kirkpatrick, Albert A.	I	" "
Lachance, Melina	VIId	" "
Lacouture, Jules	VIId	" "
Laflamme, Sidney I.	IV	" "
LaJeunesse, Joseph A.	IV	" "
Lamoureux, Leontine	VIId	" "
Lancot, Edmund N.	III	" "
Lannon, James J.	VIa	" "
Laprise, Frank E.	VIb	" "
Larkin, Joseph P.	VIa	" "
Law, John H.	VIa	" "
Lawson, Fred	VIa	" "
Learned, William	VIa	Methuen, "
Leary, Timothy A.	VIe	Lawrence, "
Leblanc, Delphis	Va	Lowell, "
Leblanc, Ovila L.	VIId	" "
Lee, Coleman H.	IIb	Lawrence, "
Lemire, Arthur	I	Lowell, "
Lincourt, Georgiana A.	VIId	" "
Lincourt, Henry E.	VIa	" "
Lindsay, Clarence D.	IIb	Andover, "
Livesey, Thomas J.	VIa	Lowell, "
Lord, Frank E.	III	" "
Lozean, Lorette	VIId	" "
Lyon, Stacy T.	III-Vb	" "
Macauley, Daniel C.	VIa	" "
Mack, Frank E.	VII	Collinsville, "
Madden, Peter	Va	Lowell, "
Mahoney, Dennis J.	Vb	No. Billerica, "
Maker, Isaac A.	VIa	Lowell, "
Manning, James B.	IV	No. Billerica, "
Mason, John H.	VIb	Lowell, "
Massey, John W.	VIa	Lawrence, "
Mathison, John A.	VIa-b	Lowell, "
McCarthy, Fred	VIa	Haverhill, "

Name	Course	Address
McCarthy, Ellen R.	III	Lowell, Mass.
McColough, William F.	VIe	" "
McComb, James H.	III	" "
McCune, Lawrence B.	VIa	" "
McDonald, Luke J.	III	Collinsville, "
McGarvey, Joseph T.	III	Lowell, "
McGee, David	IV	" "
McGowan, Charles P.	VIa	" "
McHugh, Edward J.	VIa	" "
McIntosh, Herbert H.	VIa	" "
MacKay, Hugh	IV	" "
McKeown, Austin	VIa	" "
McKone, Peter	IIa	" "
McLaughlin, Joseph I.	I	" "
MacMahon, Sidney D.	IV	" "
McMahon, Edward F.	VIa	" "
McMahon, James F.	VIa	" "
McNally, Bernard	III	" "
McNulty, Joseph A.	I	" "
MacPherson, John R.	VIa	" "
McVey, Paul K.	VIa	" "
Meadowcroft, Harry	VIe	Lawrence, "
Melincoff, John H.	VIa	" "
Meloy, Frederick F.	VIa-b	Lowell, "
Mills, Louis A.	IIb	Lawrence, "
Mills, Stanley	VIa	Lowell, "
Milot, Joseph E.	VIa	" "
Mintoft, George H.	IIb	" "
Mixer, George W.	VIa	" "
Molloy, Edward	VIa	" "
Morris, Joseph F.	Va	" "
Morse, Charles H.	I	" "
Mullen, Edward J.	VIb	" "
Mullen, Walter J.	Va	" "
Mullin, James J.	Va	" "
Murkland, Walter E.	IV	" "
Murningham, John J., Jr.	VIa	" "
Murphy, Leo T.	IV	" "
Murphy, Wm. F.	Vc	" "
Murray, Leo A.	VII	" "
Musard, Albert E., Jr.	Vc	" "
Nason, Alton L.	Va	" "
Neelon, Raymond V.	IV	" "
Nelson, Gustaf A.	Vb	" "
Newsholme, Charles E.	VIb	Methuen, "
Neylon, John	VIa-c	Lowell, "
Nichols, Nathan A.	VIb	" "
Nicoll, Edwin	VIa	Andover, "
Nicoll, John	IV	" "
Normandy, Joseph M.	VIa	Lowell, "
Nyberg, James O.	I	" "
O'Brien, George F.	VIc	" "
Oghasapian, Hagap A.	IV	" "
O'Hara, Michael F.	Vb	" "
Ohlson, William S.	VIa	" "
O'Malley, Patrick J.	Vb	" "

Name	Course	Address
O'Reilly, Bernard J.	VIa-b	Lowell, Mass.
Orrell, Frank L.	VIa	" "
Ort, Adam C.	VIa	" "
Palm, Carl H.	VIa	" "
Palmer, G. Buel	Vb	" "
Parke, Benjamin	VIa	" "
Pascall, Arthur F.	VIb	" "
Pascall, Henry H.	VIa	" "
Patterson, Alfred H.	Vb	Lawrence, "
Pearson, Fritz E.	IIb	Lowell, "
Perrin, Alfred	III	" "
Perry, Clarence R.	IIb	Methuen, "
Peters, Roy A.	VIb	Collinsville, "
Pihl, Carl J. A.	VIa	Lowell, "
Pineo, John F.	III	Lawrence, "
Pintal, Emely	VId	Lowell, "
Planilla, Placido	Vb	" "
Plunkett, Paul R.	IV	" "
Polk, Roy A.	VIa	" "
Pomfret, James O.	VIc	" "
Potter, Richard W.	III	" "
Price, Harold	VIa	" "
Pritchard, Robert W.	VIb	" "
Quimby, Henry F.	VIa	" "
Quinlan, John	VIa	" "
Quinn, Teddy	I-VIa	" "
Randall, Harold M.	I	Nashua, N. H.
Read, Paul A.	Va	Lowell, Mass.
Reed, Lewis A.	VIa	" "
Regnier, Leo	III	" "
Rice, Theodore G.	IV	" "
Richards, Beatrice G.	VId	" "
Richardson, George F.	Vb	" "
Rico, Wenceslao A.	I	" "
Riley, James	VII	Lawrence, "
Riordan, Denis	Vb	Lowell, "
Rogers, Carl H.	VIa	" "
Rogers, John F.	I	" "
Rooney, Frederick L.	I	" "
Rooney, Hugh M.	IIb	" "
Rostler, Bennie	VIb	" "
Rourke, Daniel	IV	" "
Rourke, Wm. P.	VIa	" "
St. Peter, Fred J.	III	Lawrence, "
Santos, Antony S.	VIa	Lowell, "
Scally, Edward	IV	" "
Scannell, George	VIb	" "
Scannell, Walter J.	III	" "
Schermerhorn, George E.	III	" "
Schombom, Axel W.	VIa	" "
Schuell, Joseph T.	VIa	" "
Schuster, William F.	VII	Lawrence, "
Scoble, David E.	VIa	Chelmsford, "
Scott, George W.	IIb	Andover, "
Scott, James W.	VIb	Lowell, "
Scully, James P.	Vb	" "

Name	Course	Address
Seavey, William M.	VIa	Lowell, Mass.
Seddon, N. Graham	I	Lawrence, "
Semple, Alexander	I	Lowell, "
Shackelton, J. Henry	I	Lawrence, "
Shanahan, Thomas J.	VIa-b	" "
Shannon, Philip J.	VIa	Lowell, "
Shannon, William	VIa	" "
Sharkey, Charles H.	IIb	Lawrence, "
Shaw, Harold W.	VIb	Lowell, "
Shea, John M.	VIa	" "
Sherry, Frank R.	VIb	Ballardvale, "
Shore, Henry	IV	Lowell, "
Shussier, Fred	VIc	" "
Silcox, S. Herbert	VIe	" "
Small, Forrest R.	VIa	Dracut, "
Smith, George A.	VII	Methuen, "
Smith, Harry M.	VIa	Lowell, "
Smith, William R.	I	" "
Stanley, John R.	IIb	No. Chelmsford, "
Staples, Erving E.	VIe	Lowell, "
Stephens, Paul S.	I	" "
Stephenson, Benjamin T., Jr.	IIb	Lawrence, "
Stetson, Martin R.	IV	Lowell, "
Stewart, Charles	Vc	" "
Swanson, Victor	IV	" "
Swett, Harry T.	IIa	" "
Tanner, George B.	VIa	" "
Taylor, George A.	III	Methuen, "
Taylor, Joseph, Jr.	VIb	Lowell, "
Teague, Edward F.	VIa	" "
Templeton, Henry C.	III	Collinsville, "
Tennant, Joseph A.	VIb	Methuen, "
Thomas, Harry W.	I	Lowell, "
Tighe, John J.	VIe	" "
Titley, Chester W.	III	Collinsville, "
Titus, Oscar B.	VIa	Lowell, "
Tobin, Thomas J.	I	" "
Toohey, Henry J.	III	No. Chelmsford, "
Toy, John E.	IV	Lowell, "
Tracey, John E.	VIa	" "
Tucker, John T.	Va	" "
Turner, Amos S.	IV	" "
Tyler, William F.	VIa	" "
Varnum, Arthur C.	VII	" "
Victory, Ralph H.	VIa	" "
Wallace, Albert W.	VIa	" "
Ward, Bernard D.	III	" "
Wardrobe, William L.	III	" "
Warnock, Everett F.	VIb	" "
Waterworth, Nathan	VIe	" "
Watson, George W., Jr.	IIb	Lawrence, "
Watson, Roy W.	I	Lowell, "
Webster, Harry R.	IV	" "
Weilbrenner, Ivan A.	I	" "
Weston, Clarence W.	VII	" "
Wheatly, Joseph H.	IIa	Ballardvale, "

Name	Course	Address
Wikstrom, Anders G.	VIa	Lowell, Mass.
Williams, Allen R.	I-III	" "
Williamson, Henry	I	" "
Willmott, Herbert J.	VIa-b	" "
Wilson, Garfield	IIb	" "
Witschel, Alfred C. F.	VII	Lawrence, "
Wood, Charles R.	VIa	Lowell, "
Worrall, Robert H.	VIa	" "
Worthington, John A.	I-Va	" "
Wright, Gilbert F.	VId	" "
Young, Richard, Jr.	Vc	" "

SUMMARY

Day Students	177
Evening Students	539
Total	716
Names counted twice	47
Net Total	669

ALPHABETICAL REGISTER OF GRADUATES

Name	Course	Class	Day or Evening
Abbott, Edward M.	II	1904	D
Abbott, George R.	II	1908	D
Abbott, Paul W.	I	1906	E
Ackroyd, Theodore C.	IIb	1907	E
Adams, Henry S.	IIa	1903	E
Adams, Henry S.	I	1905	D
Adams, Michael E.	VI	1904	E
Adams, William R.	IIa	1902	E
Amiot, Louis H.	Va	1906	E
Armstrong, Elias B.	IIb	1906	E
Arnold, Warren H.	VII	1908	E
Arundale, Henry B.	II-III-V	1905	D
Arundale, Henry B.	II	1907	D
Aspinwall, William	IIb	1901	E
Avery, Charles H.	II	1906	D
Bailey, Joseph W.	I	1899	D
Bain, William A.	VII	1907	E
Bake, Herbert	III	1905	E
Bake, Herbert	P. G. III	1906	E
Bake, Herbert	VII	1907	E
Baldwin, Arthur L.	IV	1900	D
Baldwin, Frederick A.	II	1904	D
Ballard, Horace W. C. S.	IV	1908	D
Ballinger, Frederick W.	IIb	1907	E
Balmforth, James H.	IIa	1903	E
Balmforth, James H.	IIa-b	1904	E
Balmforth, William F.	VI	1904	E
Balmforth, Martha B.	(See French)		
Barber, James E.	IIb	1907	E
Barker, John P.	V	1904	E
Barlow, Robert	V	1902	E
Barr, I. Walwin	I	1900	D
Barraclough, John C.	I	1907	E
Barrington, James L.	IV	1908	E
Barrington, John A.	IV	1904	E
Barry, Edward J.	III	1903	E
Bastow, Henry	III	1903	E
Bastow, Henry	V	1905	E
Bastow, Stephen W.	IV	1907	E
Baxter, Alvah J.	IIa	1903	E
Bayard, Pierre P.	III	1907	E
Begen, Thomas W.	IIb	1907	E
Begen, Thomas W.	IIb	1908	E
Bell, Frederick W.	IIa	1905	E
Bennett, Edward H.	V	1903	D
Benoit, William A.	Va	1907	E
Berry, Alfred H.	VI	1908	E
*Berry, Frank M.	III	1899	E
*Berry, Frank M.	V	1901	E
Binns, Heaton	II-V	1899	E
Binns, Heaton	VI	1902	E
Bloom, Wilfred N.	IV	1903	D
Bodwell, Henry A.	II	1900	D
Boucher, John L.	VI	1904	E

*Deceased

Name	Course	Class	Day or Evening
Bouille, Arthur L.	Vb	1907	E
Bowie, Samuel A.	VI	1905	E
Bowring, George P. B.	VI	1902	E
Boyd, George A.	I	1905	D
Bradford, Roy H.	II	1906	D
Bradley, Richard H.	V	1901	D
Brainerd, Irving L.	I	1902	E
Brannen, Leon V.	III-V	1907	D
Brannen, Leon V.	IIa	1907	E
Brickett, Chauncey J.	II	1900	D
Broadbent, James H.	Vb	1908	E
Broadbent, James T.	I	1899	E
Broadbent, William	Vb	1908	E
Brooks, Noah	III-V	1901	E
Brouder, John J.	III	1906	E
Brouder, John J.	VII	1907	E
Brown, James P.	III	1905	E
Brown, James P.	P. G. III	1906	E
Brown, James T.	III	1908	E
Brown, William G.	IIb	1906	E
Bryant, Ernest L.	VI	1905	E
Buchan, Donald C.	II	1901	D
Buckley, Harry	IV	1908	E
Bucklitsch, Gustave J.	IIb	1907	E
Burgess, Joseph H.	Va	1906	E
Burgess, Joseph H.	Vb	1907	E
Burghardt, Edward S.	IIa	1902	E
Burghardt, Paul C.	IIa	1901	E
Burke, Thomas F.	I	1905	E
Burnham, Frank E.	IV	1902	D
Burnham, Joseph W.	III	1906	E
Burnham, Wilmont V.	Vb	1906	E
Burns, Edward J.	IV	1905	E
Burns, James E.	IV	1905	E
Burrage, Katherine C.	IIIb	1899	D
Burrage, Katherine C.	P. G. IIIb	1900	D
Butler, Benjamin O.	VI	1904	E
Butterworth, Charles A.	Va	1907	E
Butterworth, John A.	IIb	1907	E
Buzzell, William O.	III	1901	E
Buzzell, William O.	P. G. III	1902	E
Byam, Walter S.	VI	1903	E
Cady, Dennis J.	V	1903	E
Callahan, Patrick A.	VI	1904	E
Campbell, Albert D.	IIb	1900	E
Campbell, Archibald	IV	1908	E
Campbell, Laura E.	IIIb	1900	D
Campbell, Louise P.	IIIb	1903	D
Campbell, Orison S.	II	1903	D
Carden, Francis E.	IIb	1907	E
Carden, Francis E.	IIb	1908	E
Carlson, Ernest B.	IIb	1907	E
Carney, William J.	I	1908	E
Caron, Cleophas	I	1905	E
Carr, George E.	I	1905	D
Carter, Charles R.	Vb	1908	E

Name	Course	Class	Day or Evening
Carter, Robert A.	IV	1902	D
Cawthra, Albert B.	IIb	1900	E
Chamberlin, Frederick E.	I	1903	D
Cheetham, John James	III	1901	E
Cheetham, John James	P. G. III	1902	E
Cheetham, John Joseph	I	1904	E
Chippindale, Ernest W.	IIb	1901	E
Church, Charles R.	II-V	1906	D
Churchill, Charles W.	III	1906	D
Clapp, F. Austin	II	1904	D
Clogston, Raymond B.	IV	1904	D
Colby, Arthur D.	I	1900	E
Cole Edward E.	IV	1906	D
Cole, James T.	II	1905	D
Collier, John	III	1899	E
Collier, John	P. G. III	1902	E
Collins, John A.	IIa-b	1905	E
Coman, James G.	I	1907	D
Conklin, Jennie G.	IIIb	1905	D
Conley, Frederick A.	VI	1904	E
Connors, Edward F.	VI	1904	E
Cook, Cheney E.	III	1905	E
Corr, Eben W.	Vb	1908	E
Corr, James F.	Vb	1908	E
Cowdell, Herbert	V	1901	E
Cowdrey, Charles E.	V	1902	E
Craig, Albert W.	IV	1907	D
Craig, Clarence E.	III	1902	D
Craven, Harry	VII	1908	E
Cremin, Daniel J.	I	1902	E
Crompton, Henry H.	II	1899	E
Culver, Ralph F.	IV	1904	D
Curran, Charles E.	II-III-V	1902	D
Currier, Herbert A.	I	1906	D
Currier, John A.	II	1901	D
Curtis, Frank M.	I	1906	D
Curtis, William L.	II	1905	D
Custer, James J. E.	V	1905	E
Cutler, Benjamin W., Jr.	III	1904	D
Cuttle, James H.	II	1899	D
Dana, Clarence A.	VI	1905	E
Davis, Henry	IIb	1901	E
Davis, Prentice T.	I	1904	E
Delmage, Edward R.	III	1904	E
Dempsey, John W.	IIa	1904	E
Dewey, James F.	II	1904	D
Dick, Hugo P.	III	1905	E
Dick, Hugo P.	P. G. III	1906	E
Dick, Hugo P.	IIb	1907	E
Dick, Hugo P.	Vb	1908	E
Dickson, Andrew	IIa	1906	E
Dillon, James H.	III	1905	D
Dimlick, Benjamin C.	III	1905	E
Dimlick, Benjamin C.	P. G. III	1906	E
Dixon, Arthur	III	1908	E
Dobbs, Willie	IIb	1907	E

Name	Course	Class	Day or Evening
Dobbs, Willie	IIb	1908	E
Dodge, Charles P.	IIa	1907	E
Dodge, Frank	I	1906	E
Donahue, Michael F.	VI	1904	E
Donald, Albert E.	II	1904	D
Donnellan, Frank T.	IIa	1902	E
Donnellan, Frank T.	V	1903	E
Donnelly, James	I	1900	E
Donovan, Daniel F.	IIa	1901	E
Doole, George L.	VI	1904	E
Dooley, Edward W.	VI	1904	E
Duce, Benjamin	III	1906	E
Duce, Benjamin	VII	1907	E
Dudley, George E.	I	1902	E
Duggan, Francis P.	VI	1904	E
Dunn, George C.	III	1908	E
Dwight, John F., Jr.	II	1908	D
Ehrenfried, Jacob B.	II-V	1907	D
Ellis, George W.	VII	1906	E
Elston, Fred R.	III	1900	E
Emerson, Frank W.	II	1903	D
Erbe, Gustave	VI	1905	E
Evans, Alfred W.	III	1903	D
Evans, William R.	III	1903	D
Evison, William A.	V	1901	E
Ewer, Nathaniel T.	IV	1901	D
Eyers, John T.	IV	1906	E
Farmer, Chester J.	IV	1907	D
Farr, Leonard S.	II	1908	D
Farrell, Thomas	IIa	1901	E
Fels, August B.	II	1899	D
Ferguson, Arthur F.	I	1902	D
Ferguson, Arthur F.	I	1903	D
Ferguson, Thomas	V	1902	E
Field, Charles W.	VI	1902	E
Fleming, Frank E.	IV	1906	D
Flint, Leon G.	III	1907	E
Flynn, John J.	VI	1903	E
Flynn, William J.	Vb	1908	E
Forrest, Fred G.	IIa	1902	E
Fortune, David A.	IIb	1902	E
Foster, Clifford E.	II	1901	D
Foster, Sherwood L.	I	1905	E
Frame, William	V	1901	E
Frank, Emil M.	III	1904	E
Frank, Emil M.	P. G. III	1906	E
Frechette, Alphonse J.	IIb	1907	E
French, Ernest J.	I	1905	E
French, Martha Balmforth	III	1903	E
Fuller, George	I	1903	D
Fuller, John M.	V	1906	E
Gagan, John H.	V	1901	E
Gahm, George L.	II	1906	D
Garner, William	III	1903	E
Gaunt, Alfred C.	III	1899	E
Gaunt, Alfred C.	P. G. III	1902	E

Name	Course	Class	Day or Evening
Gaunt, Alfred C.	IIa	1903	E
Gaunt, Alfred C.	IIb	1904	E
Gay, Earle B.	I	1905	E
Gay, Olin D.	II	1908	D
Gerrish, Walter	III	1903	D
Gillispie, James E.	VII	1907	E
Gillon, Sara A.	IIIb	1906	D
Good, Henry	I	1902	E
Goodchild, George	I	1903	E
Goodchild, George	VI	1905	E
Goodhue, Amy 'H. (See Harrison)			
Grant, Archibald	IIb	1901	E
Gray, Finley M.	VI	1903	E
Greenhalge, James	Vc	1908	E
Gregson, Robert B.	Va	1906	E
Gregson, Robert B.	I-Vc	1907	E
Groucke, Michael	IIb	1901	E
Haartz, John C.	VII	1907	E
Haas, Ignatius	I	1907	E
Hadley, Walter E.	IV	1908	D
Haigh, Walter	III	1902	E
Haigh, William	Vb	1906	E
Hallbauer, William R.	Vb	1908	E
Halsell, Elam R.	I	1904	D
Hamblett, Harry A.	I	1907	E
Hanglin, Albert J.	IV	1907	E
Hanglin, William E.	Vb	1907	E
Hanson, Edward	III	1908	E
Harder, Elmer E.	VI	1905	E
Hardman, David B.	IV	1908	E
Harmon, Charles F.	I	1899	D
Harris, Charles E.	I	1905	D
Harris, George S.	I	1902	D
Harris, Louis	VII	1908	E
Harrison, Amy Goodhue	IIIb	1900	D
Harrison, Amy Goodhue	P. G. IIIb	1901	D
Hartwell, Henry E.	VI	1906	E
Haskell, Spencer H.	II	1907	D
Haskell, Walter F.	IV	1902	D
Ilathorn, George W.	IV	1907	D
Haven, George W.	III	1905	E
Haworth, Joseph	VI	1902	E
Hebert, Charles L. J.	IV	1907	E
Hempel, Frank	V	1904	E
Hennessey, Ambrose M.	VII	1908	E
Hennigan, Arthur J.	II	1906	D
Higgins, James A.	IIa	1903	E
Higgins, James A.	IIa-b	1904	E
Hildreth, Harold W.	II-V	1906	D
Hildreth, Harold W.	II	1907	D
Hill, Daniel	IIb	1901	E
Hill, Harold	I	1908	E
Hintze, Thomas F.	I	1906	D
Hitchcock, Thomas B.	I-IIa-III	1901	E
Hitchen, Harry S.	Vb	1907	E
Hitchen, Thomas G.	Vb	1907	E

Name	Course	Class	Day or Evening
Hoellrich, Martin J.	Vb	1908	E
Hoessler, Carl, Jr.	III	1906	E
Hogan, James A.	V	1902	E
Holgate, Benjamin	III	1902	D
Holgate, Benjamin	V	1903	D
Holgate, Charles H.	IIa	1901	E
Hollings, James L.	I	1905	D
Hook, Russell W.	IV	1905	D
Horsfall, George G.	II-III-V	1904	D
Howard, John	V	1900	E
Howard, John	III	1903	E
Howard, John	IIa	1906	E
Howard, John	VII	1907	E
Howard, Thomas	V	1905	E
Hoyle, Edward	IIb	1902	E
Hoyle, Joseph	IIb	1904	E
Hoyt, Charles W. H.	IV	1907	D
Huising, Geronimo H.	I	1908	D
Hunt, Chester L.	III	1905	D
Hunt, Herbert R.	VI	1905	E
Hunter, Ralph	III	1901	E
Hunter, Ralph	V	1903	E
Hunton, Lewis G.	IV	1905	E
Hutton, Clarence	V	1900	E
Hutton, Clarence	III	1903	D
Hutton, Harold	V	1906	E
Hutton, John M.	Vb	1906	E
Ignatius, Pentti	Va	1907	E
Inberg, Magnus	I	1906	E
Ingham, Benjamin W.	I	1908	E
Jeannotte, Arthur	VI	1904	E
Jenckes, Leland A.	VI	1908	D
Jennings, James J.	III	1903	E
Jepson, Harry	Vb	1907	E
Johnson, Ernest A.	IIa-b	1902	E
Johnson, Ernest A.	V	1906	E
Johnson, Samuel L.	V	1903	E
Jones, Everett A.	II	1904	D
Jones, Everett A.	III	1905	D
Jones, William J.	IIb	1900	E
Jones, William J.	IIa	1901	E
Jury, Alfred E.	IV	1904	D
Keleher, John J.	IIb	1903	E
Kellett, Irvine	II	1899	E
Kelley, Michael H.	I	1902	E
Kelley, Michael H.	III	1907	E
Kent, Clarence L.	III-V	1906	D
Kent, Ernest J.	IIb	1902	E
Kenworthy, Joseph	I	1905	E
Kershaw, William E.	V	1904	E
Kidd, Thomas E.	IV	1906	E
Killerby, Walter	IIb	1901	E
Kimball, Irving D.	VI	1905	E
Kingsbury, Percy F.	IV	1901	D
Kirsch, Alfred O.	Vb	1907	E
Knowland, Daniel P.	IV	1907	D

Name	Course	Class	Day or Evening
Knowles, Frank E.	I	1903	E
Laffert, August W.	III	1906	E
Laffert, August W.	VII	1907	E
Lagerblad, Jarl	VII	1908	E
Lake, William F.	III	1907	E
Lake, William F.	P. G. III	1908	E
Lakeman, Fannie S.	IIIb	1900	D
Lamont, Walter M.	IIb	1902	E
Lamson, George F.	I	1900	D
Lamson, George F.	VI	1905	E
Lane, John W.	I	1906	D
Lane, John W.	I-V	1907	D
Langevin, Felix D.	VI	1904	E
Law, Alfred	IIb	1901	E
Lawliss, Augustine J.	V	1902	E
Lawrence, Charles	I	1903	E
Leach, John P.	I-V	1900	D
Leach, Joseph W.	V	1903	E
Lee, Charles	I	1902	E
Lee, William H.	V	1905	D
Leith, Edwin E.	III	1902	E
Lewis, LeRoy C.	IV	1908	D
Lewis, Walter S.	IV	1905	D
Libby, C. Robert	VI	1902	E
Lincourt, Hector L.	VI	1903	E
Linkletter, Alfred C.	VI	1905	E
Lord, Harry D.	III	1904	E
Lord, Wilfred	III	1901	E
Lord, Wilfred	IIb	1903	E
Lord, Wilfred	IIa	1904	E
Lovell, Charles E.	VI	1905	E
Lucey, Edmund A.	II	1904	D
Mackay, Stewart	III	1907	D
MacPherson, Wallace A.	III	1904	D
Maden, Harry	IIb	1900	E
Maguire, James H.	VI	1905	E
Maguire, James H.	I	1906	E
Mailey, Howard T.	II	1908	D
Maker, Isaac A.	I	1908	E
Marjerison, Isaiah D.	II	1899	E
Marjerison, T. Sydney	III	1907	E
Marjerison, T. Sydney	P. G. III	1908	E
Marinel, Walter N.	I	1901	D
Marshall, Fred K. R.	VI	1908	E
Martin, John C., Jr.	IIa-b	1905	E
Martin, Willard E.	III	1907	E
Mason, Frederick A.	I	1903	E
McAlister, John W.	V	1899	E
McBride, Robert G.	IIa	1904	E
McCarthy, Joseph F.	III	1906	E
McDonnell, William H.	I-V	1906	D
McGill, William E.	VII	1908	E
McGovern, James	VII	1908	E
McKenna, Hugh F.	IV	1905	D
McKenna, Jerimiah J.	Vb	1908	E
McLaughlin, Peter J.	I	1906	E

Name	Course	Class	Day or Evening
McLay, John	Vb	1906	E
McManus, Hugh	V	1905	E
McQuade, Hugh B.	V	1901	E
Meadows, William R.	I	1904	D
Meek, Lotta	IIIb	1907	D
Merchant, Edith C.	IIIb	1900	D
Merrill, Edwin C.	VI	1904	E
Merriman, Earl C.	II	1907	D
Michelmore, Harry	III	1906	E
Michelmore, Harry	VII	1907	E
Midwood, Arnold J.	IV	1905	D
Miller, Emil H.	V	1904	E
Minge, Jackson C.	I-V	1901	D
Minge, Jackson C.	III	1901	E
Moir, Alexander L.	III	1899	E
Moir, Alexander L.	P. G. III	1903	E
Molloy, Andrew	V	1902	E
Molloy, Andrew	III	1905	E
Molloy, Andrew	P. G. III	1906	E
Moore, Everett B.	I	1905	D
Moorehouse, Thomas	VI	1904	E
Moorhouse, William R.	IV	1901	D
Morris, Frank A.	V	1901	E
Morrison, Fred C.	I	1903	D
Mortenson, Carl W.	III	1903	E
Mortenson, Carl W.	IIa	1908	E
Morton, Albert N.	IIb	1906	E
*Mozley, Arthur	VI	1903	E
Murphy, Cornelius D.	IIa	1906	E
Murphy, John H.	VI	1904	E
Myers, James W.	III-IV	1903	E
Myers, James W.	VII	1907	E
Najarian, Garabed	IV	1903	D
Nelson, Charles E.	IIb	1907	E
Nelson, Ernest H.	IIb	1900	E
Nelson, Ernest H.	IIa	1901	E
Nelson, Ernest H.	III	1906	E
Newcomb, Guy H.	IV	1906	D
Nicholson, Richard	IIb	1903	E
Noble, John T.	V	1899	E
Noble, John T.	III	1901	E
Noonan, Denis T.	III	1903	E
Notman, Frederick W.	I	1904	E
Nugent, Thomas A.	II-V	1899	E
Nugent, Thomas A.	VI	1902	E
Nutter, James R.	VI	1908	E
O'Brien, David A.	IV	1906	E
O'Brien, Michael F.	IIb	1907	E
O'Donnell, John D.	I	1904	D
Ogley, Samuel A.	IIb	1900	E
O'Hara, William F.	IV	1904	D
O'Neill, Peter F.	IV	1905	E
*Osbeck, William J.	III	1908	E
Osgood, Charles F.	I	1900	E
Osgood, Charles F.	VI	1902	E
Overend, John	V	1905	E

*Deceased

Name	Course	Class	Day or Evening
Palmer, G. Buel	III	1903	E
Parker, B. Moore	I	1901	D
Parker, Everett N.	I	1904	D
Parker, Everett N.	I	1905	D
Parker, Harry C.	V	1900	D
Patrick, Alexander	III	1904	E
Patterson, Alfred H.	III	1908	E
Pedler, William A.	I	1906	E
Peel, Hudson	IIb	1901	E
Perkins, John E.	III	1900	D
Perkins, J. Dean	III	1908	D
Perkins, Thomas, Jr.	I	1908	E
Petty, George E.	I-V	1903	D
Picken, William	III	1908	E
Pihl, Christian E.	VI	1906	E
Pittendreigh, John M.	I	1906	E
Plumer, Paul T.	Vb	1908	E
Porter, George K., Jr.	III	1907	E
Porter, George K., Jr.	P. G. III	1908	E
Potter, Richard W.	V	1902	E
Pradel, Alois J.	III	1900	D
Pradel, Anna Walker	IIIb	1903	D
Preble, George A.	III	1908	E
Prince, Sylvanus C.	VI	1908	D
Proctor, Braman	IV	1908	D
Ramsdell, Theodore E.	I	1902	D
*Rasche, William A.	III	1903	D
Raymond, Charles A.	IV	1907	D
Read, Paul A.	VII	1907	E
Reardon, Timothy H.	VI	1906	E
Redman, Henry S.	III	1904	E
Redman, Henry S.	V	1905	E
Redman, Henry S.	I	1907	E
Reed, Foster C. K.	VI	1904	E
Reynolds, Eugene A.	VI	1906	E
Reynolds, Fred B.	II	1908	D
Reynolds, Hiram L.	III	1901	E
Reynolds, Isabel H.	III-V	1903	D
Reynolds, Isabel H.	P. G. III-V	1906	D
Rhodes, Joseph E.	V	1904	E
Richards, Francis G.	IIa	1906	E
Ritter, Alfred E.	IIb	1907	E
Robbins, John	IIb	1907	E
Roberson, Pat H.	I	1905	D
Roberts, Carrie I.	IIIb	1905	D
Robinson, Ernest W.	IV	1908	D
Robinson, William C.	III-V	1903	D
Rockwell, Henry D.	IIa	1903	E
Rockwell, Samuel F.	IIa	1902	E
Rooney, George W.	I	1904	E
*Rowell, Herman C.	I-IIb	1900	E
Rushworth, Walter	VI	1906	E
Saalfrank, Joseph C.	III	1908	E
Saunders, Edward B.	III	1901	E
Sally, Edward	VI	1908	E
Scanlon, Edward J.	IIb	1901	E

*Deceased

Name	Course	Class	Day or Evening
Schermerhorn, George E.	I	1902	E
Schermerhorn, George E.	Va	1908	E
Schofield, John S.	III	1903	E
Schoon, Fenton	IIb	1903	E
Schubert, George J.	V	1906	E
Schuster, William F.	VII	1908	E
Seddon, N. Graham	III	1908	E
Semple, Alexander	III	1908	E
Senior, George	Va	1906	E
Senior, George	I-Vc	1907	E
Shackelton, John H.	IV	1908	E
Shannon, Philip J.	V	1901	E
Sharpe, John R.	VI	1906	E
Shaw, James	V	1904	E
Sheppard, Byron H.	VI	1906	E
Silcox, Arthur E.	I	1900	E
Silk, Frederick C. M.	IV	1905	E
Silk, Patrick E.	VII	1906	E
Simola, Emil J.	IIa-b	1905	E
Simoneau, Verner W.	VI	1908	E
Skinner, Clarence W.	III	1905	E
Skinner, Clarence W.	P. G. III	1906	E
Skinner, Clarence W.	VII	1907	E
Sleeper, Robert R.	IV	1900	D
*Smith, Albert A.	I	1899	D
Smith, Arthur	III	1905	E
Smith, Arthur	P. G. III	1906	E
Smith, Arthur	Va	1906	E
Smith, Arthur	Vc	1907	E
Smith, Edward	I	1904	E
Smith, Ernest B.	Vb	1907	E
Smith, Fred	IIb	1901	E
Smith, George A.	III	1905	E
Smith, George A.	P. G. III	1906	E
Smith, James	Vb	1907	E
Smith, John W.	IIb	1904	E
Smith, Percy H.	Vb	1907	E
Smith, Ralston F.	I	1904	D
Smith, Stephen E.	I	1900	D
Smith, William E.	III	1905	E
Smith, William E.	P. G. III	1906	E
Smith, William E.	VII	1907	E
Smith, William H.	IIb	1902	E
Snelling, Fred N.	II	1903	D
Snow, Fred L.	IV	1900	E
Spedding, Ephraim H.	III	1899	E
Spiegel, Edward	V	1903	D
Spurr, Albert R.	VII	1908	E
Spurr, James H., Jr.	IV	1908	E
Sterling, Walter	III	1904	E
Stevens, Dexter	I	1904	D
Stevens, Frank W.	VI	1905	E
Stevenson, Murray R.	III-V	1903	D
Stevenson, William	II	1899	E
Stevenson, William	III	1902	E
Stewart, Arthur A.	II	1900	D

*Deceased

Name	Course	Class	Day or Evening
Stewart, Charles	Va	1908	E
Stewart, Walter L.	III	1903	D
Stockham, Burton I.	IV	1903	E
Stockham, Burton I.	P. G. IV	1904	E
Stohn, Alexander C.	III-V	1906	D
Stopherd, William H.	II-V	1899	E
Stopherd, William H.	VI	1902	E
Stopherd, William H.	III	1905	E
Stopherd, William H.	P. G. III	1906	E
Storer, Francis E.	II	1907	D
Stursberg, Paul W.	II	1907	D
Swan, Guy C.	II	1906	D
Swift, Edward S.	V	1899	E
Swift, Edward S.	I	1901	E
Swift, Edward S.	I	1902	D
Syme, James F.	II	1900	D
Tarpey, John F.	IIa	1904	E
Teichmann, Alfred A.	Vb	1908	E
Thomas, Roland V.	I	1905	D
Thompson, Charles B.	VI	1904	E
Thompson, Everett L.	I	1905	D
Thompson, Henry J.	IV	1900	D
Tilton, Elliott T.	II	1899	D
Tonge, John	IV	1905	E
Tonge, Matthew	III	1903	E
Toovey, Sidney E.	V	1904	D
Tucker, John T.	I	1908	E
Umpleby, Thomas B.	V	1902	E
Upton, Frank A.	I	1903	E
Varney, Manley H.	III	1902	E
Varney, Manley H.	I	1903	E
Varnum, Arthur C.	II	1906	D
Varnum, Arthur C.	Vb	1907	E
Varnum, Arthur C.	P. G. III	1908	E
Vogt, Alfred H.	III	1902	E
Vogt, Harry A.	Vb	1906	E
Walker, Anna G. (See Pradel)			
Walker, David	III	1902	E
Walker, David	P. G. III	1903	E
Walker, William, Jr.	VII	1906	E
Ward, James J.	VII	1906	E
Wardrobe, William L.	I	1900	E
Warren, Philip H.	II	1905	D
Waterhouse, Joseph	IV	1900	E
Waterworth, Frank W.	Vb	1907	E
Webb, Francis H.	V	1904	E
Webb, Francis H.	III	1907	E
Webb, Frank H.	IV	1904	D
Webber, Arthur H.	IV	1901	D
Webber, John F.	III	1907	E
Webber, John F.	P. G. III	1908	E
Weinz, W. Elliot	IV	1908	D
Wesson, Paul B.	I	1901	E
Wahlberg, Einar S.	I	1907	E
Wheelock, Stanley H.	II	1905	D
*Whitcomb, Harry E.	I	1906	E

*Deceased

Name	Course	Class	Day or Evening
White, Royal P.	II	1904	D
Whitehead, Bennett	IIb	1901	E
Whittaker, Thomas	IIb	1907	E
Whittaker, Thomas	IIb	1908	E
Wiggin, Leon M.	III	1907	E
Wiggin, Leon M.	P. G. III	1908	E
Wightman, William H.	IV	1906	D
Wilde, Thomas E.	IIa	1905	E
Willey, Frank S.	I	1901	E
Willgeroth, Henry J.	III	1908	E
Williamson, Isaac F.	IV	1901	E
Wilmot, Joseph	III	1908	E
Wilmot, William	III	1899	E
Wilson, Calvin E.	IIb	1902	E
Wilson, George H.	IIb	1902	E
Wilson, John S.	II	1903	D
Wilson, Walter E. H.	I	1904	D
Wilton, George H.	III	1899	E
Wing, Charles T.	III	1900	E
Wing, Charles T.	III	1902	D
Wingate, William H.	IV	1908	D
Wise, Paul T.	II	1901	D
Wiswall, Frank T.	V	1905	E
Wolf, William C.	Va	1907	E
Wolf, William C.	Vb	1908	E
Wolger, John J.	III	1907	E
Wood, Herbert C.	I	1906	D
Wood, Jonathan	I	1902	E
Wood, Jonathan	Va	1908	E
Woodbury, W. Sanford	I	1900	E
Woodcock, Eugene C.	II	1907	D
Woodies, Ida A.	IIIb	1900	D
Woodies, Ida A.	P. G. IIIb	1901	D
Woodman, Harry L.	I-III-V	1902	D
Woodruff, Charles B.	V	1906	D
Wright, Edward, Jr.	II	1905	D
Yare, John F.	Vb	1907	E
Young, Richard, Jr.	Va	1908	E

REGISTER OF GRADUATES

- (C) Indicates Certificate, Partial Course.
 (D) Indicates Diploma, Complete Course.
 (P. G.) Indicates Post Graduate Course.
 (x) Indicates Last Known Address.
 (*) Deceased.

Day Course, 1899.

Name	Course	Occupation
Bailey, Joseph W.	I D	Principal, Bradford-Durfee Textile School, Fall River, Mass.
Burrage, Katherine C.	IIIb C	Teacher, Evening Drawing School, Lowell Mass.
Cuttle, James H.	II D	Designer, Harding, Whitman and Co., New York City.
Fels, August B.	II D	Yarn Salesman, New England Cotton Yarn Co., New York City.
Harmon, Charles F.	I D	In business, Lowell, Mass.
*Smith, Albert A.	I D	
Tilton, Elliott T.	II D	Electrician, General Electric Co., Boston, Mass.

Evening Course, 1899.

*Berry, Frank M.	III C	
Binns, Heaton	II-V C	Foreman, Worsted Dept., Shuttleworth Bros. Co., Amsterdam, N. Y.
Broadbent, James T.	I C	In Converting House, New York City.
Collier, John	III C	Superintendent, American Woolen Company, No. Vassalboro, Me.
Crompton, Henry H.	II C	Instructor, French Spinning, Lowell Textile School, Lowell, Mass.
Gaunt, Alfred C.	III C	Treasurer and Manager, Tremont Worsted Co., Methuen, Mass.
Kellett, Irvine	II C	Second Hand Worsted Spinning, Lower Pacific Mills, Lawrence, Mass.
Marjerison, Isaiah D.	II C	Overseer Top Mill, Arlington Mills, Lawrence, Mass.
McAlister, John W.	V C	In Real Estate business, Winston-Salem, N. C.
Moir, Alexander L.	III C	Letter Carrier, Lowell, Mass.
xNoble, John T.	V C	With Amoskeag Mfg. Co., Manchester, N. H.
Nugent, Thomas A.	II-V C	Overseer Worsted Spinning, Bigelow Carpet Co., Lowell, Mass.
Spedding, Ephraim H.	III C	Second Hand Weaving, Tremont and Suffolk Mills, Lowell, Mass.
xStevenson, Wm.	II C	Supt. Franklin Woolen Mills, Franklin, Ky.
Stopherd, William H.	II-V C	Overseer Worsted Spinning, Bigelow Carpet Co., Lowell, Mass.

Name	Course	Occupation
Swift, Edward S.	V C	Student, Canisius College, Buffalo, N. Y.
Wilmot, William	III C	Designer, Hamilton Webb Co., Hamilton, R. I.
Wilton, George H.	III C	Overseer, M. T. Stevens and Sons Co., No. Andover, Mass.

Day Course, 1900.

Baldwin, Arthur L.	IV D	Chemist, Lowell, Mass.
Barr, I. Walwin	I D	Designer, Lawrence and Co., New York City.
Bodwell, Henry A.	II D	Supt., Smith and Dove Mfg. Co., Andover, Mass.
Brickett, Chauncey J.	II D	Principal, School of Textiles, International Correspondence School, Scranton, Pa.
Burrage, Katherine C. P. G.	IIIb C	See Day Course, 1899.
Campbell, Laura E.	IIIb C	Designer, Lowell, Mass.
xHarrison, Mrs. Amy H. (Goodhue)	IIIb C	Dracut, Mass.
Lakeman, Fannie S.	IIIb C	Designer, Salem, Mass.
Lamson, George F.	I D	Draftsman, Lowell, Mass.
xLeach, John P.	I-V C	Foreman, Harriet Cotton Mills, Henderson, N. C.
Merchant, Edith C.	IIIb C	Designer, Lowell, Mass.
Parker, Harry C.	V C	In business, Franklin, N. H.
Perkins, John E.	III D	Asst. Supt., S. N. and C. Russell Mfg. Co., Pittsfield, Mass.
Pradel, Alois J.	III D	Designer, Montrose Mills, Woonsocket, R. I.
Sleeper, Robert R.	IV D	Instructor in Dyeing, Lowell Textile School, Lowell, Mass.
Smith, Stephen E.	I D	Head instructor, Cotton Dept., Lowell Textile School, Lowell, Mass.
Stewart, Arthur A.	II D	Head Instructor, Finishing, Lowell Textile School, Lowell, Mass.
Syme, James F.	II D	Agent, Saxonville Mills, Saxonville, Mass.
Thompson, Henry J.	IV D	Dyer, Boston Rubber Shoe Co., Malden, Mass.
Woodies, Ida A.	IIIb C	Designer, Boston, Mass.

Evening Course, 1900.

Campbell, Albert D.	IIb C	Section Hand, Arlington Mills, Lawrence, Mass.
Cawthra, Albert B.	IIb C	Overseer, Moore Spinning Co., North Chelmsford, Mass.
Colby, Arthur D.	I C	Draughtsman, Lowell Machine Shop, Lowell, Mass.
Donnelly, James	I C	Second Hand, Mule Room, Boston Mfg. Co., Waltham, Mass.
Elston, Fred R.	III C	Designer, Shackamaxon Worsted Co., Philadelphia, Pa.
Howard, John	V C	Lowell, Mass.
Hutton, Clarence	V C	Circulation Manager, Lord and Nagle Co., Boston, Mass.

Name	Course	Occupation
Jones, William J.	I Ib C	Overseer, Worsted Spinning, U. S. Bunting Co., Lowell, Mass.
Maden, Harry	I Ib C	Overseer, Worsted Spinning, Walsh's Mill, Lowell, Mass.
Nelson, Ernest H.	I Ib C	Overseer, Weaving, Preston Fabric Tire Co., Buffalo, N. Y.
Ogley, Samuel A.	I Ib C	With Brookside Worsted Mills, North Chelmsford, Mass.
xOsgood, Charles	I C	Draftsman, General Electric Company, Lynn, Mass.
*Rowell, Herman C.	I-I Ib C	
Silcox, Arthur E.	I C	Draftsman, Lowell Machine Shop, Lowell, Mass.
Snow, Fred L.	IV C	Overseer, Dyeing and Bleaching, Lawrence Mfg. Co., Lowell, Mass.
Wardrobe, Wm. L.	I C	With Mass. Cotton Mills, Lowell, Mass.
xWaterhouse, Joseph	IV C	Section Hand, Merrimack Print Works, Lowell, Mass.
Wing, Charles T.	III C	Designer, Middlesex Mfg. Co., Lowell, Mass.
Woodbury, W. Sanford	I C	Overseer Carding, Orswell Mills, Fitchburg, Mass.

Day Course, 1901.

Bradley, Richard H.	V C	Pawtucket, R. I.
Buchan, Donald C.	II D	Asst. Supt., Stevens Mills, No. Andover, Mass.
Currier, John A.	II D	Asst. Supt., Stevens and Co., Haverhill, Mass.
Ewer, Nathaniel T.	IV D	Chemist, American Dyewood Co., Chester, Pa.
Foster, Clifford E.	II D	Whitehall, N. Y.
xHarrison, Mrs. Amy H.	P. G. IIIb C	See Day, 1900.
(Goodhue)		
Kingsbury, Percy F.	IV D	Second Hand, Merrimack Mfg. Co., Lowell, Mass.
Marinel, Walter N.	I D	No. Chelmsford, Mass.
Minge, Jackson C.	I-V C	Treasurer, Minge Mfg. Co., Demopolis, Ala.
Moorhouse, William R.	IV D	Chemist, Cassella Color Co., Boston, Mass.
Parker, B. Moore	I D	Instructor, Carding and Spinning, A. and M. College, West Raleigh, N. C.
Webber, Arthur H.	IV D	Chemist, F. E. Atteaux and Co., Boston, Mass.
Wise, Paul T.	II D	Agent, Bigelow Carpet Co., Clinton, Mass.
Woodies, Ida A.	P. G. IIIb C	See Day, 1900.

Evening Course, 1901.

xAspinwall, William	I Ib C	Section Hand, Drawing, Atlantic Mills, Providence, R. I.
*Berry, Frank M.	V C	
xBrooks, Noah	III-V C	Lowell, Mass.
xBurghardt, Paul C.	I Ia C	Second Hand, Card Room, Merrimack Woolen Co., Lowell, Mass.

Name	Course	Occupation
Buzzell, William O.	III C	Second Hand, Weaving, Bristol Mfg. Co., New Bedford, Mass.
Cheetham, John James	III C	Spindle Setter, Mass. Cotton Mills, Lowell, Mass.
Chippindale, Ernest W.	IIb C	Section Hand, Moore Spinning Co., No. Chelmsford, Mass.
Cowdell, Herbert	V C	Loomfixer, Hamilton Mfg. Co., Lowell, Mass.
Davis, Henry	IIb C	Overseer, Carding, Moore Spinning Co., No. Chelmsford, Mass.
xDonovan, Daniel F.	IIa C	Second Hand, Woolen Carding, Yonkers, N. Y.
Evison, William A.	V C	Loomfixer, Mass. Cotton Mills, Lowell, Mass.
Farrell, Thomas	IIa C	Woolen Spinner, Stirling Mills, Lowell, Mass.
xFrame, William	V C	Overseer, Johnson & Johnson, New Brunswick, N. J.
Gagan, John H.	V C	Overseer, Stirling Mills, Lowell, Mass.
Grant, Archibald	IIb C	Section Hand, Spinning, Bigelow Carpet Co., Lowell, Mass.
Grouke, Michael	IIb C	Overseer, Drawing, Bigelow Carpet Co., Lowell, Mass.
Hill, Daniel	IIb C	With Maine Alpaca Co., Springvale, Me.
Hitchcock, Thomas B.	I-IIa-III C	With Consolidated Duck Co., Baltimore, Md.
Holgate, Charles H.	IIa C	Manager, Selmar Hess, New York City.
Hunter, Ralph	III C	Salesman, Hall, Hartwell and Co., Troy, N. Y.
Jones, William J.	IIa C	See Evening, 1900.
Killerby, Walter	IIb C	Overseer, Park Worsted Mill, Lowell, Mass.
Law, Alfred	IIb C	Section Hand, Arlington Mills, Lawrence, Mass.
Lord, Wilfred	III C	Inspector, Textile Fabrics, U. S. Government, Boston, Mass.
McQuade, Hugh B.	V C	Loomfixer, Bigelow Carpet Co., Lowell, Mass.
Minge, Jackson C.	III C	See Day, 1901.
xMorris, Frank A.	V C	Loomfixer, Lowell, Mass.
Nelson, Ernest H.	IIa C	See Evening, 1900.
Noble, John T.	III C	See Evening, 1899.
Peel, Hudson	IIb C	Methuen, Mass.
Reynolds, Hiram L.	III C	Agent, Saunders Cotton Mills, Saundersville, Mass.
xSaunders, Edward B.	III C	In business, Fall River, Mass.
Scanlon, Edward J.	IIb C	In business, Lawrence, Mass.
Shannon, Philip J.	V C	Loomfixer, Belvidere Woolen Mills, Lowell, Mass.
Smith, Fred	IIb C	Supt., Yarn Dept., Wood Worsted Mills, Lawrence, Mass.
Swift, Edward S.	I C	See Evening, 1899.
Wesson, Paul B.	I C	Foreman Machinist, Lowell Machine Shop, Lowell, Mass.
Whitehead, Bennett	IIb C	Overseer, Wood Worsted Mill, Lawrence, Mass.

Name	Course	Occupation
xWilley, Frank S.	I C	Second Hand, Carding, Upper Pacific Mills, Lawrence, Mass.
Williamson, Isaac F.	IV C	Overseer, Hamilton Print Works, Lowell, Mass.

Day Course, 1902.

Burnham, Frank E.	IV D	Chemist, Avery Chemical Co., Boston, Mass.
Carter, Robert A.	IV D	Textile chemist and expert, Roessler & Hasslacher Chemical Company, New York City.
xCraig, Clarence E.	III D	Auditor, Meriden Creamery Co., Kansas City, Mo.
Curran, Charles E.	II-III-V C	Head Designer, Wood Worsted Mills, Lawrence, Mass.
Ferguson, Arthur F.	I C	Instructor, Design Dept., Lowell Textile School, Lowell, Mass.
Harris, George S.	I C	Supt., Lanett Cotton Mills, West Point, Ga.
Haskell, Walter F.	IV D	Overseer of Dyeing, Dana Warp Mills, Westbrook, Me.
Holgate, Benjamin	III C	Cost Accountant, Boott Mills, Lowell, Mass.
Ramsdell, Theodore E.	I D	Agent, Monument Mills, Housatonic, Mass.
Swift, Edward S.	I D	See Evening, 1899.
Wing, Charles T.	III D	See Evening, 1900.
Woodman, Harry L.	I-III-V C	Installer, Barber, Coleman Co., Boston, Mass.

Evening Course, 1902.

xAdams, Wm. R.	IIa C	Pressman, Stevens Mills, No. Andover, Mass.
Barlow, Robert	V C	Clerk, Lowell, Mass.
Binns, Heaton	VI C	See Evening, 1899.
Bowring, George P. B.	VI C	Machinist, Lowell Machine Shop, Lowell, Mass.
xBrainerd, Irving L.	I C	Overseer, Carding, W. L. Barrell and Co., Lawrence, Mass.
xBurghardt, Edward S.	IIa C	Lawrence, Mass.
Buzzell, Wm. O.	P. G. III C	See Evening, 1901.
Cheetham, John James	P. G. III C	See Evening, 1901.
Collier, John	P. G. III C	See Evening, 1899.
xCowdrey, Charles E.	V C	Overseer, Burling and Sewing, Talbot Mills, No. Billerica, Mass.
xCremin, Daniel J.	I C	Second Hand, Boott Mills, Lowell, Mass.
Donnellan, Frank T.	IIa C	Lowell, Mass.
xDudley, George E.	I C	Third Hand, Carding, Mass. Mills, Lowell, Mass.
Ferguson, Thomas	V C	Second Hand, Appleton Co., Lowell, Mass.
xField, Charles W.	VI C	Draftsman, C. F. Morrill, Somerville, Mass.
xForrest, Fred G.	IIa C	Finishing Room, Middlesex Co., Lowell, Mass.
Fortune, David A.	IIb C	Section Hand, Worsted Spinning, Lower Pacific Mills, Lawrence, Mass.

Name	Course	Occupation
Gaunt, Alfred C.	P. G. III C	See Evening, 1899.
xGood, Henry	I C	Providence, R. I.
xHaigh, Walter	III C	U. S. Bunting Co., Lowell, Mass.
xHaworth, Joseph	VI C	Machinist, Claremont, N. H.
xHogan, James A.	V C	Lowell, Mass.
Hoyle, Edward	IIb C	Asst. Supt., Moore Spinning Co., North Chelmsford, Mass.
Johnson, Ernest A.	IIa-b C	Asst. Supt., Washington Mills, Lawrence, Mass.
Kelley, Michael H.	I C	Second Hand, Appleton Co., Lowell, Mass.
Kent, Ernest J.	IIb C	Section Hand, Worsted Spinning, Lower Pacific Mills, Lawrence, Mass.
Lamont, Walter M.	IIb C	Asst. Agent, Wood Worsted Mill, Lawrence, Mass.
Lawliss, Augustine J.	V C	Overseer Weaving, Belvidere Woolen Co., Lowell, Mass.
Lee, Charles	I C	Machinist, Lowell Machine Shop, Lowell, Mass.
Leith, Edwin E.	III C	Asst. Supt., Thos. Kent Mfg. Co., Clifton Heights, Pa.
Libby, C. Robert	VI C	Draftsman-Designer, Lamson Consolidated Store Service Co., Lowell, Mass.
Molloy, Andrew	V C	Overseer of Spooling, Tremont and Suffolk Mills, Lowell, Mass.
Nugent, Thomas A.	VI C	See Evening, 1899.
Osgood, Charles F.	VI C	See Evening, 1900.
Potter, Richard W.	V C	Second Hand Weaving, Mass. Cotton Mills, Lowell, Mass.
Rockwell, Samuel F.	IIa C	Supt., Mule Dept., Davis and Furber Machine Co., No. Andover, Mass.
Schermerhorn, George E.	I C	Overseer, Boott Mills, Lowell, Mass.
Smith, Wm. H.	IIb C	Postal Clerk, Postoffice, Lawrence, Mass.
Stevenson, William	III C	See Evening, 1899.
Stopherd, Wm. H.	VI C	See Evening, 1899.
Umpleby, Thomas B.	V C	Supt., J. A. Humphrey and Son, Ltd., Moncton, N. B.
xVarney, Manley H.	III C	Overseer, Finishing Dept., Amoskeag Mfg. Co., Manchester, N. H.
xVogt, Alfred H.	III C	Designing Room, George E. Kunhardt, Lawrence, Mass.
Walker, David	III C	Overseer, Burlington Mills, Winooski, Vt.
Wilson, Calvin E.	IIb C	Overseer, Twisting, Cranston Worsted Mills, Bristol, R. I.
Wilson, George H.	IIb C	Section Hand, Lower Pacific Mills, Lawrence, Mass.
Wood, Jonathan	I C	Overseer, Boott Mills, Lowell, Mass.

Day Course, 1903.

Bennett, Edward H.	V C	Bus. Mgr., F. P. Bennett and Co., New York City.
Bloom, Wilfred N.	IV D	Asst. Mgr., Read, Holliday and Sons, Ltd., New York City.
Campbell, Louise P.	IIIb C	Designer, Lowell, Mass.
Campbell, Orison S.	II D	Supt., American Felt Co., City Mills, Mass.

Name	Course	Occupation
Chamberlin, Frederick E.	I D	With Monument Mills, Housatonic, Mass.
Emerson, Frank W.	II D	Supt., Moosup Mills, Moosup, Conn.
xEvans, Alfred W.	III D	Arlington Mills, Lawrence, Mass.
xEvans, William R.	III D	Bradford, Mass.
Ferguson, Arthur F.	I D	See Day, 1902.
Fuller, George	I D	Designer, Arnold Print Works, No. Adams, Mass.
Gerrish, Walter	III D	Malden, Mass.
Holgate, Benj.	V C	See Day, 1902.
Hutton, Clarence	III C	See Evening, 1900.
Morrison, Fred C.	I D	Clerk, Levi W. Phelps, Ayer, Mass.
Najarian, Garabed	IV D	Overseer of Dyeing, Monument Mills, Housatonic, Mass.
Petty, George E.	I-V C	In business, Greensboro, N. C.
Pradel, Mrs. A. J. (Walker)	IIIb C	Woonsocket, R. I.
*Rasche, Wm. A.	III D	
Reynolds, Isabel H.	III-V C	Clerk, Arlington Mills, Lawrence, Mass.
xRobinson, Wm. C.	III-V C	With Russell Mfg. Co., Middletown, Conn.
Snelling, Fred N.	II D	With American Express Co., Haverhill, Mass.
xSpiegel, Edward	V C	In business, New York City.
Stevenson, Murray R.	III-V C	Pasadena, Cal.
Stewart, Walter L.	III D	Designer, Clarence Whitman and Company, New York City.
xWilson, John S.	II D	Designer, U. S. Bunting Co., Lowell, Mass.

Evening Course, 1903.

Adams, Henry S.	IIa C	Purchasing Agent, Union Buffalo Mills Co., Union, S. C.
Balmforth, James H.	IIa C	Clerk, P. O., Bloomfield, N. J.
Barry, Edward J.	III C	Overseer, Weaving, Jackson Mfg. Company, Nashua, N. H.
Bastow, Henry	III C	Warp Dresser, Arlington Mills, Lawrence, Mass.
Baxter, Alvah J.	IIa C	Bookkeeper, Assabet Mills, Maynard, Mass.
Byam, Walter S.	VI C	Draftsman, Lowell Machine Shop, Lowell, Mass.
Cady, Dennis J.	V C	Section Hand, Washington Mills, Lawrence, Mass.
Donnellan, Frank T.	V C	See Evening, 1902.
Flynn, John J.	VI C	Bookkeeper, Coffey Bros., Lowell, Mass.
French, Mrs. Martha B. (Balmforth)	III C	Tewksbury, Mass.
xGarner, William	III C	Foreman of Refinery, Warren Bros. Co., Washington, D. C.
Gaunt, Alfred C.	IIa C	See Evening, 1899.
Goodchild, George	I C	Draftsman, Lowell Machine Shop, Lowell, Mass.
Gray, Finley M.	VI C	With Merrimac Co., Lowell, Mass.
xHiggins, James A.	IIa C	Spinner, Talbot Mills, No. Billerica, Mass.
Howard, John	III C	See Evening, 1900.
Hunter, Ralph	V C	See Evening, 1901.

Name	Course	Occupation
Jennings, James J.	III C	Designer, Lyman Mills, Holyoke, Mass.
Johnson, Samuel L.	V C	Second Hand Weaving, Arlington Mills, Lawrence, Mass.
Keleher, John J.	IIb C	Drawer, Prospect Mill, Lawrence, Mass.
Knowles, Frank E.	I C	Overseer, Tremont and Suffolk Mills, Lowell, Mass.
xLawrence, Charles	I C	Overseer Mule Spinning, Dartmouth Corp., New Bedford, Mass.
xLeach, Joseph W.	V C	Designer, Pacific Mills, Lawrence, Mass.
Lincourt, Hector L.	VI C	New York City.
Lord, Wilfred	IIb C	See Evening, 1901.
Mason, Frederick A.	I C	Mule Spinner, Saxony Worsted Mills, Newton, Mass.
Moir, Alexander L.	P. G. III C	See Evening, 1899.
Mortenson, Carl W.	III C	Paymaster, Talbot Mills, No. Billerica, Mass.
*Mozley, Arthur	VI C	
Myers, James W.	III-IV C	Clerk, U. S. Bunting Co., Lowell, Mass.
Nicholson, Richard	IIb C	Section Hand, Washington Mills, Lawrence, Mass.
xNoonan, Denis T.	III C	Asst. Supt., Knoxville Woolen Mills, Knoxville, Tenn.
xPalmer, G. Buel	III C	Lowell, Mass.
Rockwell, Henry D.	IIa C	Clerk, Davis and Furber Machine Co., No. Andover, Mass.
Schofield, John S.	III C	Asst. Supt. and Designer, Lawrence Keegan Mill, Wilsonville, Conn.
Schoon, Fenton	IIb C	Section Hand, Worsted Drawing, Lower Pacific Mills, Lawrence, Mass.
Stokham, Burton I.	IV C	Chemist, Bigelow Carpet Co., Lowell, Mass.
xTonge, Matthew	III C	Weaver, Dartmouth Mfg. Co., New Bedford, Mass.
Upton, Frank A.	I C	Overseer, Carding, I. E. Palmer Co., Middletown, Conn.
Varney, Manley H.	I C	See Evening, 1902.
Walker, David	P. G. III C	See Evening, 1902.

Day Course, 1904.

Abbott, Edward M.	II D	Clerk, Abbott Worsted Co., Graniteville, Mass.
Baldwin, Frederick A.	II D	With Walter Blue and Co., Ltd., Sherbrooke, P. Q., Canada.
Clapp, F. Austin	II D	Asst. to Selling Agent, Earnscliffe Worsted Mills, New York City.
Clogston, Raymond B.	IV D	Foreman, Arnold Print Works, No. Adams, Mass.
Culver, Ralph F.	IV D	Supt. Holliston Mills, Norwood, Mass.
Cutler, Benj. W., Jr.	III D	With W. H. Hinchman and Co., New York City.
Dewey, James F.	II D	Supt., Dewey's Mills, Quechee, Vt.
Donald, Albert E.	II D	With Atlas Linen Co., Meredith, N. H.
xHalsell, Elam R.	I C	With Appleton Mills, Lowell, Mass.
xHorsfall, George G.	II-III-V C	Asst. Designer, Martinsburg Worsted and Cassimere Co., Martinsburg, W. Va.

Name	Course	Occupation
Jones, Everett A.	II C	With Nye and Wait Carpet Co., Auburn, N. Y.
Jury, Alfred E.	IV D	Chemist, Wells and Richardson Company, Burlington, Vt.
Lucey, Edmund A.	II D	With Smith and Dove Mfg. Co., Andover, Mass.
MacPherson, Wallace A.	III D	Asst. Designer, National and Providence Worsted Mills, Providence, R. I.
Meadows, Wm. R.	I D	Director, Miss. Textile School, Agricultural College, Miss.
O'Donnell, John D.	I C	Clerk, Travers Bros. Co., New York City.
O'Hara, Wm. F.	IV C	Chemist, Lowell, Mass.
Parker, Everett N.	I C	With Parker Spool and Bobbin Company, Lewiston, Me.
Smith, Ralston, F.	I C	Secretary and Treasurer, Davies Printing Co., Cleveland, Ohio.
Stevens, Dexter	I D	Supt. of Yarn Dept., Lancaster Mills, Clinton, Mass.
Toovey, Sidney E.	V C	With Talbot Mills, No. Billerica, Mass.
Webb, Frank H.	IV D	Chemist, American Woolen Co., Lawrence, Mass.
White, Royal P.	II D	Supt., Stirling Mills, Lowell, Mass.
Wilson, Walter E. H.	I C	Machinist, D. H. Wilson and Co., Lowell, Mass.

Evening Course, 1904.

Adams, Michael E.	VI C	Bookkeeper, National Biscuit Co., Lowell, Mass.
Balmforth, James H.	IIa-b C	See Evening, 1903.
xBalmforth, Wm. F.	VI C	No. Billerica, Mass.
xBarker, John P.	V C	Peacedale, R. I.
Barrington, John A.	IV C	With Kalle and Co., Boston, Mass.
xBoucher, John L.	VI C	Lowell, Mass.
xButler, Benj. O.	VI C	Lowell, Mass.
xCallahan, Patrick A.	VI C	With Lower Pacific Mills, Lawrence, Mass.
xCheetham, John Joseph	I C	Carder, Lowell, Mass.
xConley, Frederick A.	VI C	Machinist, Kitson Machine Co., Lowell, Mass.
Connors, Edward F.	VI C	Draftsman, Locks and Canals, Lowell, Mass.
Davis, Prentice T.	I C	Bookkeeper, O. P. Davis, Lowell, Mass.
Delmage, Edward R.	III C	Overseer Weaving and Asst. Supt., Thos. Kent Mfg. Co., Clifton Heights, Pa.
xDempsey, John W.	IIa C	Spinner, Bigelow Carpet Co., Lowell, Mass.
xDonahue, Michael F.	VI C	Boston, Mass.
Doole, George L.	VI C	Weaver, U. S. Bunting Co., Lowell, Mass.
Dooley, Edward W.	VI C	With Spencer and Co., Lowell, Mass.
Duggan, Francis P.	VI C	Second Hand, U. S. Cartridge Co., Lowell, Mass.
Frank, Emil M.	III C	Asst. Designer, Arlington Mills, Lawrence, Mass.
Gaunt, Alfred C.	IIb C	See Evening, 1899.
Hempel, Frank	V C	Room Hand, Washington Mills, Lawrence, Mass.

Name	Course	Occupation
Higgins, James A.	IIa-b C	See Evening, 1903.
Hoyle, Joseph	IIb C	Overscer, Drawing, Moore Spinning Co., No. Chelmsford, Mass.
Jeannotte, Arthur	VI C	With Heinze Electric Co., Lowell, Mass.
xKershaw, Wm. E.	V C	Weaver, Talbot Mills, No. Billerica, Mass.
Langevin, Felix D.	VI C	Asst. Supt., Kitson Machine Shop, Lowell, Mass.
xLord, Harry D.	III C	Lowell, Mass.
Lord, Wilfred	IIa C	See Evening, 1901.
xMcBride, Robert G.	IIa C	Mule fixer, Merrimack Woolen Mills, Lowell, Mass.
Merrill, Edwin C.	VI C	Draftsman, Eng. Dept., City Hall, Law- rence, Mass.
Miller, Emil H.	V C	Charge of Supply Dept., Lower Pacific Mills, Lawrence, Mass.
Moorehouse, Thomas	VI C	Wireman, Wood Worsted Mills, Lawrence, Mass.
Murphy, John H.	VI C	Clerk, Supply Dept., City Hall, Low- ell, Mass.
Notman, Frederick W.	I C	Clerk, Mass. Cotton Mills, Boston, Mass.
xPatrick, Alexander	III C	Omaha, Neb.
Redman, Henry S.	III C	Clerk, Appleton Co., Lowell, Mass.
xReed, Foster C. K.	VI C	Steam Engineer, Farwell Bleachery, Law- rence, Mass.
Rhodes, Joseph E.	V C	Wire Sharpener, Mass. Mohair Plush Co., Lowell, Mass.
Rooney, George W.	I C	Overseer, N. H. Spinning Mill, Penacook, N. H.
xShaw, James	V C	Loomfixer, Lowell, Mass.
Smith, Edward	I C	Overseer Carding, Boott Mills, Lowell, Mass.
Smith, John W.	IIb C	Section Hand, Arlington Mills, Lawrence, Mass.
xSterling, Walter	III C	New Bedford, Mass.
Stokham, Burton I.	P. G. IV C	See Evening, 1903.
xTarpey, John F.	IIa C	With Merrimack Mfg. Co., Lowell, Mass.
Thompson, Charles B.	VI C	Clerk, B. and M. Railroad, Lowell, Mass.
xWebb, Francis H.	V C	Quiller, Mass. Mohair Plush Co., Lowell, Mass.

Day Course, 1905.

Adams, Henry S.	I D	See Evening, 1903.
Arundale, Henry B.	II-III-V C	Lawrence, Mass.
Boyd, George A.	I D	Office Mgr., Chicopee Mfg. Co., Chicopee Falls, Mass.
Carr, George E.	I D	Foreman, Mending Dept., Wyoming Val- ley Lace Mills, Wilkesbarre, Pa.
Cole, James T.	II D	Overseer of Linen and Rug Mfg., Mass. Commission for Adult Blind, Cam- bridge, Mass.
Conklin, Jennie G.	IIIb C	Commercial Designer, Boston, Mass.
Curtis, Wm. L.	II C	Clerk, Parker, Wilder and Co., Boston, Mass.
Dillon, James H.	III D	With Walworth Bros., Boston, Mass.

Name	Course	Occupation
Harris, Charles E.	I D	Charge of Finishing and Cloth Depts., West Boylston Mfg. Co., Easthampton, Mass.
Hollings, James L.	I D	Designer, American Mills Co., Waterbury, Conn.
Hook, Russell W.	IV D	Salesman, Arthur Merritt, Boston, Mass.
Hunt, Chester L.	III C	Sample Dresser and Weaver, Peacedale Mfg. Co., Peacedale, R. I.
Jones, Everett A.	III D	See Day, 1904.
Lee, Wm. H.	V C	Overseer, Farr Alpaca Co., Holyoke, Mass.
Lewis, Walter S.	IV D	Asst. Physicist, Bureau of Standards, Washington, D. C.
McKenna, Hugh F.	IV D	Chemist, United Indigo and Chemical Co., Ltd., Boston, Mass.
Midwood, Arnold J.	IV D	Chemist, Levinstein and Co., Boston, Mass.
Moore, Everett B.	I D	With Chadbourne and Moore, Chelsea, Mass.
Parker, Everett N.	I D	See Day, 1904.
xRoberson, Pat H.	I C	Lowell, Mass.
Roberts, Carrie I.	IIIb C	Designer, Lowell, Mass.
xThomas, Roland V.	I C	Lowell, Mass.
Thompson, Everett L.	I D	With Brown, Durrell and Co., Boston, Mass.
Warren, Philip H.	II D	Asst. Supt. and Designer, Locustville Woolen Co., Hope Valley, R. I.
Wheelock, Stanley H.	II D	Supt., Stanley Woolen Co., Uxbridge, Mass.
Wright, Edward, Jr.	II C	Asst. in Engineering Dept., State Board of Health, Boston, Mass.

Evening Course, 1905.

Bake, Herbert	III C	Asst. Designer, Walworth Bros., Lawrence, Mass.
Bastow, Henry	V C	See Evening, 1903.
xBell, Frederick W.	IIa C	With Mass. Mills, Lowell, Mass.
Bowie, Samuel A.	VI C	Engineer, Pacific Mills, Lawrence, Mass.
xBrown, James P.	III C	Pilling Shoe Shop, Lowell, Mass.
Bryant, Ernest L.	VI C	Clerk, D. B. Wilson Co., Waterbury, Conn.
xBurke, Thomas F.	I C	Lowell, Mass.
Burns, Edward J.	IV C	Chemist, U. S. Cartridge Co., Lowell, Mass.
Burns, James E.	IV C	Foreman, Testing Dept., U. S. Cartridge Co., Lowell, Mass.
xCaron, Cleophas	I C	Second Hand, Spinning Dept., Queen City Cotton Co., Burlington, Vt.
Collins, John A.	IIa-b C	Inspector, Arkwright Mutual Fire Ins Co., Boston, Mass.
Cook, Cheney E.	III C	Buyer, Winslow Bros. and Smith Company, Norwood, Mass.
Custer, James J. E.	V C	Lowell, Mass.
Dana, Clarence A.	VI C	Draftsman, Lowell Machine Shop, Lowell, Mass.

Name	Course	Occupation
Dick, Hugo P.	III C	Loomfixer, Lower Pacific Mills, Lawrence, Mass.
Dimlick, Benj. C.	III C	Cloth Examiner, Wood Worsted Mills, Lawrence, Mass.
Erbe, Gustave	VI C	Foreman, J. L. Thompson Mfg. Company, Roberts, Mass.
Foster, Sherwood L.	I C	With Lowell Brass Foundry, Lowell, Mass.
xFrench, Ernest J.	I C	Clerk, Upper Pacific Mills, Lawrence, Mass.
Gay, Earle B.	I C	Second Hand Carding, Dana Warp Mills, Westbrook, Me.
Goodchild, George	VI C	See Evening, 1903.
Harder, Elmer E.	VI C	Janitor, Highland School, Lowell, Mass.
Haven, George W.	III C	With Blake and Stearns, Boston, Mass.
Howard, Thomas	V C	Overseer, T. Martin and Bro. Mfg. Co., Lowell, Mass.
xHunt, Herbert R.	VI C	Asst. Chief Draftsman, DeLamar's Copper Refining Co., Chrome, N. J.
xHunton, Lewis G.	IV C	In business, Lowell, Mass.
Kenworthy, Joseph	I C	Second Hand, Boott Mills, Lowell, Mass.
Kimball, Irving D.	VI C	Patent Dept., Lowell Machine Shop, Lowell, Mass.
Lamson, George F.	VI C	See Day, 1900.
Linkletter, Alfred C.	VI C	Steamfitter, H. R. Barker Mfg. Co., Lowell, Mass.
xLovell, Charles E.	VI C	Los Angeles, Cal.
Maguire, James H.	VI C	Overseer, Lowell Machine Shop, Lowell, Mass.
Martin, John C., Jr.	IIa-b C	Tailor, J. C. Martin, Lowell, Mass.
xMcManus, Hugh	V C	With Middlesex Co., Lowell, Mass.
Molloy, Andrew	III C	See Evening, 1902.
O'Neill, Peter F.	IV C	Warp Dyer, Arlington Mills, Lawrence, Mass.
xOverend, John	V C	Hand Dresser, Arlington Mills, Lawrence, Mass.
Redman, Henry S.	V C	See Evening, 1904.
Silk, Frederick C. M.	IV C	Asst. Colorist, Bigelow Carpet Co., Lowell, Mass.
Simola, Emil J.	IIa-b C	Finland.
Skinner, Clarence W.	III C	With Brightwood Mfg. Co., No. Andover, Mass.
Smith, Arthur	III C	Designing, Pemberton Mills, Lawrence, Mass.
Smith, George A.	III C	Asst. Supt., Tremont Worsted Co., Methuen, Mass.
Smith, Wm. E.	III C	Cloth Inspector, Arlington Mills, Lawrence, Mass.
Stevens, Frank W.	VI C	Draftsman, Locks and Canals, Lowell, Mass.
Stopherd, Wm. H.	III C	See Evening, 1899.
Tonge, John	IV C	Asst. Dyer and Chemist, Dana Warp Mills, Westbrook, Me.
xWilde, Thomas E.	IIa C	Stenographer, Jeremiah Clark Machine Co., Lowell, Mass.
Wiswall, Frank T.	V C	Storekeeper and Receiving Clerk, George E. Kunhardt's Mill, Lawrence, Mass.

Day Course, 1906.

Name	Course	Occupation
Avery, Charles H.	II D	With Geo. C. Moore Mills, No. Chelmsford, Mass.
Bradford, Roy H.	II D	Asst. Supt., Smith and Dove Mfg. Co., Andover, Mass.
Church, Charles R.	II-V C	Lawrence, Mass.
Churchill, Charles W.	III D	Treasurer, J. Harriman Narrow Fabric Co., Lowell, Mass.
Cole, Edward E.	IV D	With Sulloway Mills, Franklin Falls, N. H.
Currier, Herbert A.	I D	With C. E. Riley Co., New York City.
Curtis, Frank M.	I D	With Wm. Curtis Sons Co., Boston, Mass.
Fleming, Frank E.	IV D	Asst. Dyer, Goodall Worsted Co., Sanford, Me.
Gahm, George L.	II D	Asst. Supt., Wood Worsted Mills, Lawrence, Mass.
Gillon, Sara A.	IIIb C	Designer, Lowell, Mass.
Hennigan, Arthur J.	II D	With The Noera Flannel and Woolen Mills, Boston, Mass.
Hildreth, Harold W.	II-V C	With Arlington Mills, Lawrence, Mass.
Hintze, Thomas F.	I C	Providence, R. I.
Kent, Clarence L.	III-V C	In business, Bay State Loan Co., Lawrence, Mass.
Lane, John W.	I C	Section Hand, Everett Mills, Lawrence, Mass.
McDonnell, William H.	I-V C	South Boston, Mass.
Newcomb, Guy H.	IV C	Mgr. Badische Co., San Francisco, Cal.
Reynolds, Isabel H.	P. G. III-V C	See Day, 1903.
Stohn, Alexander C.	III-V C	Cloth Inspector, C. Stohn, Jamaica Plain, Mass.
Swan, Guy C.	II D	Clerk, American Express Co., Lawrence, Mass.
Varnum, Arthur C.	II D	With Talbot Mills, No. Billerica, Mass.
Wightman, William H.	IV D	Traveling Salesman, Farbenfabriken of Elberfeld Co., Boston, Mass.
Wood, Herbert C.	I D	Second Hand, Tremont and Suffolk Mills, Lowell, Mass.
Woodruff, Charles B.	V C	With Goodall, Brown and Co., Birmingham, Ala.

Evening Course, 1906.

Abbott, Paul W.	I C	Foreman, Screw Machine Dept., Adder Machine Co., Wilkesbarre, Pa.
Amiot, Louis H.	Va C	American Hide and Leather Co., Lowell, Mass.
Armstrong, Elias B.	IIb C	With Joy, Langdon and Co., Boston, Mass.
Bake, Herbert	P. G. III C	See Evening, 1905.
Brouder, John J.	III C	Asst. Designer, Wood Worsted Mills, Lawrence, Mass.
Brown, James P.	P. G. III C	See Evening, 1905.

Name	Course	Occupation
Brown, Wm. G.	IIb C	President, Geo. C. Moore Wool Scouring Mills and Brookside Worsted Mills, No. Chelmsford, Mass.
Burgess, Joseph H.	Va C	Pattern Weaver, Pemberton Mills, Lawrence, Mass.
Burnham, Joseph W.	III C	Designer, Puritan Mills, Plymouth, Mass.
Burnham, Wilmont V.	Vb C	With Wood Worsted Mills, Lawrence, Mass.
Dick, Hugo P.	P. G. III C	See Evening, 1905.
xDickson, Andrew	IIa C	Asst. Shipping Clerk, Coronet Worsted Co., Mapleville, R. I.
Dimlick, Benj. C.	P. G. III C	See Evening, 1905.
Dodge, Frank	I C	Second Hand, Hamilton Co., Lowell, Mass.
Duce, Benj.	III C	Overseer Weaving, Brightwood Mfg. Co., No. Andover, Mass.
Ellis, George W.	VII C	With A. D. Ellis and Sons, Monson, Mass.
Eyers, John T.	IV C	Wet Finisher, Bound Brook Woolen Co., Bound Brook, N. Y.
Frank, Emil M.	P. G. III C	See Evening, 1904.
xFulton, John M.	V C	Lowell Bleachery, Lowell, Mass.
Gregson, Robert B.	Va C	Third Hand, Combing Room, Hamilton Mfg. Co., Lowell, Mass.
xHaigh, Wm.	Vb C	Boott Mills, Lowell, Mass.
xHartwell, Henry E.	VI C	Engineer, Washington Mills, Lawrence, Mass.
Hoessler, Carl, Jr.	III C	Loomfixer, Arlington Mills, Lawrence, Mass.
Howard, John	IIa C	See Evening, 1900.
xHutton, Harold	V C	With N. E. Bunting Co., Lowell, Mass.
xHutton, John M.	Vb C	With N. E. Bunting Co., Lowell, Mass.
xInberg, Magnus	I C	Fitchburg, Mass.
Johnson, Ernest A.	V C	See Evening, 1902.
Kidd, Thomas E.	IV C	Cable Inspector, N. E. Telephone Co., Boston, Mass.
Laffert, August W.	III C	Loomfixer, Wood Worsted Mills, Lawrence, Mass.
Maguire, James H.	I C	See Evening, 1905.
McCarthy, Joseph F.	III C	Cloth Examiner, Wood Worsted Mills, Lawrence, Mass.
McLaughlin, Peter J.	I C	Second Hand, Mass. Cotton Mills, Lowell, Mass.
McLay, John	Vb C	Clerk, Washington Mills, Lawrence, Mass.
Michelmores, Harry	III C	Asst. Designer, Brightwood Mfg. Co., No. Andover, Mass.
Molloy, Andrew	P. G. III C	See Evening, 1902.
Morton, Albert N.	IIb C	At Lowell Machine Shop, Lowell, Mass.
Murphy, Cornelius D.	IIa C	Second Hand, N. E. Bunting Co., Lowell, Mass.
Nelson, Ernest H.	III C	See Evening, 1900.
xO'Brien, David A.	IV C	With Carleton and Hovey, Lowell, Mass.
Pedler, Wm. A.	I C	Clerk, Cotton Dept., Arlington Mills, Lawrence, Mass.
Pihl, Christian E.	VI C	Master Mechanic, Appleton Mills, Lowell, Mass.
xPittendreigh, John M.	I C	Third Hand, Merrimack Mill, Lowell, Mass.

Name	Course	Occupation
Reardon, Timothy H.	VI C	Machinist, Lowell Machine Shop, Lowell, Mass.
Reynolds, Eugene A.	VI C	With Lawrence Mfg. Co., Lowell, Mass.
xRichards, Francis G.	Ila C	Wool Sorter, Arlington Mills, Lawrence, Mass.
Rushworth, Walter	VI C	Electrician, Godfrey Electric Construction Co., Boston, Mass.
Schubert, George J.	V C	Second Hand, Pemberton Co., Lawrence, Mass.
Senior, George	Va C	Seattle, Wash.
Sharpe, John R.	VI C	Overseer, Lowell Machine Shop, Lowell, Mass.
Sheppard, Byron H.	VI C	Draftsman, C. R. Makepeace and Company, Providence, R. I.
Silk, Patrick E.	VII C	Overseer, Carpet Finishing, Westboro Mills, Westboro, Mass.
Skinner, Clarence W.	P. G. III C	See Evening, 1905.
Smith, Arthur	P. G. III C	See Evening, 1905.
	Va C	
Smith, George A.	P. G. III C	See Evening, 1905.
Smith, Wm. E.	P. G. III C	See Evening, 1905.
Stopherd, Wm. H.	P. G. III C	See Evening, 1899.
Vogt, Harry A.	Vb C	Loomfixer, Wood Worsted Mills, Lawrence, Mass.
Walker, Wm., Jr.	VII C	Asst. to Supt., Ottaqueeche Woolen Co., No. Hartland, Vt.
Ward, James J.	VII C	With U. S. Bunting Co., Lowell, Mass.
*Whitcomb, Harry E.	I C	

Day Course, 1907.

Arundale, Henry B.	II D	See Day, 1905.
xBrannen, Leon V.	III-V C	Philadelphia, Pa.
Coman, James G.	I D	Instructor, Cotton Yarns, Lowell Textile School, Lowell, Mass.
Craig, Albert W.	IV D	Color Chemist, Arthur Merritt, Boston, Mass.
Ehrenfried, Jacob B.	II-V C	Boston, Mass.
Farmer, Chester J.	IV D	Chemical Expert, U. S. Dept. of Agriculture, Harvard Medical School, Boston, Mass.
Haskell, Spencer H.	II D	Worcester, Mass.
Hathorn, George W.	IV D	Instructor, Dyeing Dept., Lowell Textile School, Lowell, Mass.
Hildreth, Harold W.	II D	See Day, 1906.
Hoyt, Charles W. H.	IV D	With Farbenfabriken of Elberfeld Co., Boston, Mass.
Knowland, Daniel P.	IV D	Dyer, Brown Stocking Co., Ipswich, Mass.
Lane, John W.	I-V C	See Day, 1906.
Mackay, Stewart	III D	Instructor, Hand Loom Weaving, Lowell Textile School, Lowell, Mass.
Meek, Lotta	IIIb C	Lowell, Mass.
Merriman, Earl C.	II D	Shirley, Mass.
Raymond, Charles A.	IV D	Chemist, N. E. Gas and Coke Company, Everett, Mass.

Name	Course	Occupation
Storer, Francis E.	II D	Clerk, National Shawmut Bank, Boston, Mass.
Stursberg, Paul W.	II D	Germany.
Woodcock, Eugene C.	II D	Instructor, Woolen Yarns, Lowell Textile School, Lowell, Mass.

Evening Course, 1907.

xAckroyd, Theodore C.	IIb C	Chicago, Ill.
Bain, William A.	VII C	Overseer, Dyeing, Priscilla Woolen Co., Spencer, Mass.
Bake, Herbert	VII C	See Evening, 1905.
Ballinger, Frederick W.	IIb C	With Moore Spinning Co., No. Chelmsford, Mass.
Barber, James E.	IIb C	Combing Fixer, Moore Spinning Co., No. Chelmsford, Mass.
Barraclough, John C.	I C	Clerk, Arlington Mills, Lawrence, Mass.
Bastow, Stephen W.	IV C	Second Hand, Dyehouse, Nashua Mfg. Co., Nashua, N. H.
xBayard, Pierre P.	III C	South Bend, Ind.
Begen, Thomas W.	IIb C	Overseer, Washington Mills, Lawrence, Mass.
Benoit, William A.	Va C	Loom Fixer, Everett Mills, Lawrence, Mass.
xBouille, Arthur L.	Vb C	Washington Mills, Lawrence, Mass.
Brannen, Leon V.	IIa C	See Day, 1907.
Brouder, John J.	VII C	See Evening, 1906.
Bucklitsch, Gustave J.	IIb C	Section Hand, Washington Mills, Lawrence, Mass.
Burgess, Joseph H.	Vb C	See Evening, 1906.
Butterworth, Charles A.	Va C	Corduroy Cutter, Merrimack Mfg. Co., Lowell, Mass.
Butterworth, John A.	IIb C	Section Hand, Washington Mills, Lawrence, Mass.
Carden, Francis E.	IIb C	Mass. Cotton Mills, Lowell, Mass.
Carlson, Ernest B.	IIb C	West Chelmsford, Mass.
Dick, Hugo P.	IIb C	See Evening, 1905.
Dobbs, Willie	IIb C	Section Hand, Mass. Mohair Plush Co., Lowell, Mass.
Dodge, Charles P.	IIa C	Machinist, C. S. Dodge, Lowell, Mass.
Duce, Benjamin	VII C	See Evening, 1906.
Flint, Leon G.	III C	Percher, Washington Mills, Lawrence, Mass.
Fréchette, Alphonse J.	IIb C	Section Hand, Lower Pacific Mills, Lawrence, Mass.
Gillespie, James E.	VII C	Wet Finishing, Brightwood Mfg. Company, No. Andover, Mass.
Gregson, Robert B.	I-Vc C	See Evening, 1906.
Haartz, John C.	VII C	Of W. A. and J. C. Haartz, Boston, Mass.
Haas, Ignatius	I C	New York City.
Hamblett, Harry A.	I C	Second Hand, Merrimack Mfg. Co., Lowell, Mass.
Hanglin, Albert J.	IV C	With American Hide and Leather Co., Lowell, Mass.
xHanglin, William E.	Vb C	Worcester, Mass.
Hebert, Charles L. J.	IV C	With Federal Shoe Co., Lowell, Mass.

Name	Course	Occupation
Hitchen, Harry S.	Vb C	Bay State Mills, Lowell Mass.
Hitchen, Thomas G.	Vb C	Bay State Mills, Lowell Mass.
Howard, John	VII C	See Evening, 1900.
xIgnatius, Pentti	Va C	Appleton Co., Lowell, Mass.
Jepson, Harry	Vb C	With U. S. Bunting Co., Lowell, Mass.
Kelley, Michael H.	III C	See Evening, 1902.
Kirsch, Alfred O.	Vb C	Washington Mills, Lawrence, Mass.
Laffert, August W.	VII C	See Evening, 1906.
Lake, William F.	III C	Asst. Designer, Middlesex Co., Lowell, Mass.
Marjerison, T. Sydney	III C	Clerk, Lower Pacific Mills, Lawrence, Mass.
Martin, Willard E.	III C	With Joy, Langdon and Co., Boston, Mass.
Michelmores, Harry	VII C	See Evening, 1906.
Myers, James W.	VII C	See Evening, 1903.
Nelson, Charles E.	IIb C	West Chelmsford, Mass.
xO'Brien, Michael F.	IIb C	Bigelow Carpet Co., Lowell, Mass.
Porter, George K., Jr.	III C	With Joy, Langdon and Co., Boston, Mass.
Read, Paul A.	VII C	Mass. Cotton Mills, Lowell, Mass.
Redman, Henry S.	I C	See Evening, 1904.
xRitter, Alfred E.	IIb C	Lawrence, Mass.
Robbins, John	IIb C	With Moore Spinning Co., No. Chelmsford, Mass.
Senior, George	I-Vc C	See Evening, 1906.
Skinner, Clarence W.	VII C	See Evening, 1905.
Smith, Arthur	Vc C	See Evening, 1905.
Smith, Ernest B.	Vb C	With American Woolen Co., Lawrence, Mass.
Smith, James	Vb C	Loom Fixer, Wood Worsted Mills, Lawrence, Mass.
xSmith, Percy H.	Vb C	Washington Mills, Lawrence, Mass.
Smith, William E.	VII C	See Evening, 1905.
Varnum, Arthur C.	Vb C	See Day, 1906.
Waterworth, Frank W.	Vb C	Second Hand, Washington Mills, Lawrence, Mass.
Webb, Francis H.	III C	See Evening, 1904.
Webber, John F.	III C	Designer, Joy, Langdon and Co., Boston, Mass.
xWahlberg, Einer S.	I C	Fitchburg, Mass.
Whittaker, Thomas	IIb C	Bookkeeper, Arlington Mills, Lawrence, Mass.
Wiggin, Leon M.	III C	Pattern Weaver, U. S. Bunting Co., Lowell, Mass.
Wolf, William C.	Va C	Loom Fixer, Pacific Mills, Lawrence, Mass.
xWolger, John J.	III C	Loom Fixer, Methuen Co., Methuen, Mass.
Yare, John F.	Vb C	Middlesex Co., Lowell, Mass.

Day Course, 1908

Name	Course	Occupation
Abbott, George R.	II D	With Columbian Rope Co., Auburn, N. Y.
Ballard, Horace W. C. S.	IV D	Chemist, Levinstein and Co., Philadelphia, Pa.
Dwight, John F., Jr.	II D	With Standish Worsted Co., Plymouth, Mass.
Farr, Leonard S.	II D	With Farr Alpaca Co., Holyoke, Mass.
Gay, Olin D.	II D	With Gay Bros. Co., Cavendish, Vt.
Hadley, Walter E.	IV D	Instructor in Chemistry, Lowell Textile School, Lowell, Mass.
Huising, Geronimo H.	I D	Student, Lowell Textile School, Lowell, Mass.
Jenckes, Leland A.	VI D	Asst. Master Mechanic, Dwight Mfg. Co., Chicopee, Mass.
Lewis, LeRoy C.	IV D	No. Woburn, Mass.
Mailey, Howard T.	II D	With Wood Worsted Mills, Lawrence, Mass.
Perkins, Joshua D.	III D	With Amoskeag Mfg. Co., Manchester, N. H.
Prince, Sylvanus C.	VI D	Lowell, Mass.
Proctor, Braman	IV D	Chemist, Badische Aniline Co., New York City.
Reynolds, Fred B.	II D	Pattern Weaver, Sutton's Mills, North Andover, Mass.
Robinson, Ernest W.	IV D	Chemist, Rock Mfg. Co., Rockville, Conn.
Weinz, W. Elliot	IV D	Chemist, Badische Aniline Co., New York City.
Wingate, William H.	IV D	Chemist, Nonotuck Silk Co., Florence, Mass.

Evening Course, 1908

Arnold, Warren H.	VII C	Loomfixer, U. S. Bunting Co., Lowell, Mass.
Barrington, James L.	IV C	Color Chemist, Kalle and Co., New York City.
Begen, Thomas W.	IIb C	See Evening, 1907.
Berry, Alfred H.	VI C	Electrical Engineer, Moore Spinning Co., No. Chelmsford, Mass.
Broadbent, James H.	Vb C	With U. S. Bunting Co., Lowell, Mass.
Broadbent, William	Vb C	Weaver, U. S. Bunting Co., Lowell, Mass.
Brown, James T.	III C	Section Hand, Moore Spinning Co., No. Chelmsford, Mass.
Buckley, Harry	IV C	Overseer, Warp Dyeing, Arlington Mills, Lawrence, Mass.
Campbell, Archibald	IV C	Asst. to Chemist, J. C. Ayer Co., Lowell, Mass.
Carden, Francis E.	IIb C	See Evening, 1907.
xCarney, William J.	I C	With Arlington Mills, Lawrence, Mass.
Carter, Charles R.	Vb C	Weaver, Washington Mills, Lawrence, Mass.
Corr, Eben W.	Vb C	With Prudential Life Ins. Co., Lawrence, Mass.
Corr, James F.	Vb C	Pattern Weaver, Bay State Mills, Lowell, Mass.

Name	Course	Occupation
Craven, Harry	VII C	Clerk, Arlington Mills, Lawrence, Mass.
Dick, Hugo P.	Vb C	See Evening, 1905.
Dixon, Arthur	III C	With Elston Worsted Co., Methuen, Mass.
Dobbs, Willie	IIb C	See Evening, 1907.
Dunn, George C.	III C	Third Hand, Dyehouse, Tremont and Suffolk Mills, Lowell, Mass.
Flynn, William J.	Vb C	Weaver, Faulkner Mills, No. Billerica, Mass.
Greenhalge, James	Vc C	Second Hand, Hamilton Mfg. Co., Lowell, Mass.
xHallbauer, William R.	Vb C	At Washington Mills, Lawrence, Mass.
Hanson, Edward	III C	With Merrimack Mfg. Co., Lowell, Mass.
Hardman, David B.	IV C	Machine Printer, Pacific Mills, Lawrence, Mass.
Harris, Louis	VII C	Asst. to Clothing Designer, J. Peavy and Bros., Boston, Mass.
Hennessey, Ambrose M.	VII C	At Talbot Mills, No. Billerica, Mass.
Hill, Harold	I C	Section Hand, Arlington Mills, Lawrence, Mass.
Hoellrich, Martin J.	Vb C	With Wood Worsted Mills, Lawrence, Mass.
Ingham, Benjamin W.	I C	Section Hand, Boott Mills, Lowell, Mass.
Lagerblad, Jarl	VII C	Asst. Chemist, Wood Worsted Mills, Lawrence, Mass.
Lake, William F.	P. G. III C	See Evening, 1907.
Maker, Isaac A.	I C	Draftsman, Lowell Machine Shop, Lowell, Mass.
Marjerison, T. Sydney	P. G. III C	See Evening, 1907.
Marshall, Fred K. R.	VI C	Electrician, Arlington Mills, Lawrence, Mass.
McGill, William E.	VII C	With Talbot Mills, No. Billerica, Mass.
xMcGovern, James	VII C	Cloth Inspector, Arlington Mills, Lawrence, Mass.
McKenna, Jeremiah J.	Vb C	With Merrimack Woolen Co., Dracut, Mass.
Mortenson, Carl W.	IIa C	See Evening, 1903.
Nutter, James R.	VI C	With Merrimack Mfg. Co., Lowell, Mass.
*Osbeck, William J.	III C	
Patterson, Alfred H.	III C	Clerk, Lower Pacific Mills, Lawrence, Mass.
Perkins, Thomas, Jr.	I C	Asst. Supt., Tremont and Suffolk Mills, Lowell, Mass.
Picken, William	III C	Clerk, Moore Spinning Co., No. Chelmsford, Mass.
Plumer, Paul T.	Vb C	With U. S. Bunting Co., Lowell, Mass.
Porter, George K., Jr.	P. G. III C	See Evening, 1907.
Preble, George A.	III C	Second Hand, Mass. Cotton Mills, Lowell, Mass.
Saalf Frank, Joseph C.	III C	Design Dept., Arlington Mills, Lawrence, Mass.
Scally, Edward	VI C	With Merrimack Mfg. Co., Lowell, Mass.
Schermerhorn, George E.	Va C	See Evening, 1902.
Schuster, William F.	VII C	Second Hand, Washington Mills, Lawrence, Mass.
Seddon, N. Graham	III C	Second Hand, Everett Mills, Lawrence, Mass.

Name	Course	Occupation
Seiple, Alexander	III C	Shipping Clerk, Hamilton Mfg. Company, Lowell, Mass.
Shackleton, J. Henry	IV C	Overseer, Dyeing, Pemberton Mills, Lawrence, Mass.
Simoneau, Verner W.	VI C	Machinist, Upton and Gilman, Lowell, Mass.
Spurr, Albert K.	VII C	Wet Finisher Second Hand, Pacific Mills, Lawrence, Mass.
Spurr, James H., Jr.	IV C	Asst. Bacteriologist and Chemist, State Board of Health Experiment Station, Lawrence, Mass.
Stewart, Charles	Va C	Weaver, Tremont and Suffolk Mills, Lowell, Mass.
Teichmann, Alfred A.	Vb C	With Pemberton Mills, Lawrence, Mass.
Tucker, John T.	I C	Clerk, Kitson Machine Shop, Lowell, Mass.
Varnum,*Arthur C.	P. G. III C	See Day, 1906.
Webber, John F.	P. G. III C	See Evening, 1907.
Whittaker, Thomas	IIb C	See Evening, 1907.
Wiggin, Leon M.	P. G. III C	See Evening, 1907.
Willgeroth, Henry J.	III C	Loomfixer, Washington Mills, Lawrence, Mass.
Wilmot, Joseph	III C	Instructor, Weaving Dept., Lowell Textile School, Lowell, Mass.
Wolf, William C.	Vb C	See Evening, 1907.
Wood, Jonathan	Va C	See Evening, 1902.
Young, Richard, Jr.	Va C	Loomfixer, Mass. Cotton Mills, Lowell, Mass.

CONTENTS

Additional Equipment	23
Administration	9-125
Advanced Standing	75
Alumni Association	127
Application Blank	75-177-178
Athletics	69
Attendance	79
Attendance Card	75
Awards of Merit	78
Buildings	21
Bulletins and Catalogue	82
Calendar	12-13
Certificate of Evening Courses	31
Conduct	80
Corporation	5
COURSES OF INSTRUCTION:	
Day Classes	27-83
Evening Classes	27
Day Classes	27-71-83
Diploma	79
Entrance Qualifications	71
Equipment	33
Evening Classes	27
Examinations	77
Fees	75
General Committees	7
General Information	81
Graduate Course	78
Graduates, Day Class, 1908	128
Graduates, Alphabetical Register	144
Graduates, Class Register	156
Introduction	15
Instructors	9-125
Library	81
Materials	82
Medal	79
Object of the School	15
OUTLINE OF INSTRUCTION:	
Chemistry and Dyeing Department	106
Cotton Department	94
Decorative Art Department	105
Designing and Power Weaving Department	103
Finishing Department	115
Textile Engineering Department	119
Woolen and Worsted Department	99
Records and Reports of Standing	77
Register of Day Students	129
Register of Evening Students	133
Sessions	81
Southwick Textile Club	128
Special Courses	78
Summary of Students	143
Thesis	78
Women's Department	31

(DAY)

FILL OUT AND SEND TO PRINCIPAL

Lowell Textile School

LOWELL, MASS.

APPLICATION BLANK

Date.....

I, hereby
apply for admission to the Lowell Textile School as DAY
student.

Name in Full,

Date and Place of Birth,

Home Residence,

Parent or Guardian,

Residence of Parent or Guardian,

School last attended,

(INDICATE COURSE)

- | | |
|--------------------------|---------------------------|
| I. Cotton Manufacturing. | II. Wool Manufacturing. |
| III. Textile Designing. | IV. Chemistry and Dyeing. |
| VI. Textile Engineering. | |

Signature,

ENDORSEMENT BY OFFICER OF SCHOOL LAST ATTENDED

I hereby certify that
the above applicant has completed the regular four years
course at the High School, and has satisfac-
torily passed the subjects required under "Entrance Qualifica-
tions," pages 71-75 of Catalogue of 1909-1910.

Signed :

Principal School, located
at State of

Date.....

FORM FOR EVENING CLASSES ON OTHER SIDE

(EVENING)

FILL OUT AND SEND TO PRINCIPAL

Lowell Textile School

LOWELL, MASS.

APPLICATION BLANK

DATE.....

I, hereby
apply for admission to the Lowell Textile School as *EVENING*
student.

Name in Full,

Date and Place of Birth,

Home Residence,

Parent or Guardian,

Residence of Parent or Guardian,

School last attended,

(INDICATE COURSE)

- | | |
|-----------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| I. Cotton Spinning. | V. Weaving.
a—Cotton Weaving.
b—Woolen and Worsted Weaving.
c—Dobby and Jacquard Weaving. |
| II. a—Woolen Spinning.
b—Worsted Spinning. | VI. Engineering
a—Mechanics and Electricity
b—Mechanical Drawing.
c—Architectural Drawing.
d—Freehand Drawing
e—Machine Shop |
| III. Designing. | |
| IV. Chemistry and Dyeing. | VII. Woolen and Worsted Finishing. |

Signature,

ENDORSEMENT BY SOME OFFICER OF SCHOOL LAST ATTENDED

I hereby certify that
the above applicant is duly qualified to pursue with profit the
work of the Lowell Textile School.

SIGNED:

Principal School, located
at State of

Date

BULLETIN

OF THE

Lowell Textile School

Lowell, Massachusetts, U. S. A.



ISSUED QUARTERLY

Entered Aug. 26, 1902, at Lowell, Massachusetts
as second-class matter under Act of
Congress, July 16, 1894

Moody Street and Colonial Avenue

FOR BULLETIN AND TERMS ADDRESS CHAS. H. EAMES, PRINCIPAL

Machine Shop Practice at the Lowell Textile School

By GEORGE H. PERKINS,

Head of Engineering Department

The technical press has recently given much attention to the discussion of the methods, merits and results of the workshops of our technical schools. Numberless articles have been written by practical mechanics, and others interested in the matter, but there is apparently no agreement as to what is the most efficient method of operating a school shop to get results of practical value. Between the extreme views of those who insist that nothing useful can be learned right in a school and the academic notions of the pure theorists of industrial training who often consider that shop work is wholly of "psychological" value, there are many and varied opinions. Some would make such work wholly instructional in character while others would attempt to make a school shop serve a commercial purpose in addition to its function of training for usefulness. Admitting at once the impossibility of any school-shop training immature students into skilled workmen, the question arises how can such work be done, retaining when possible the atmosphere and commercial features of a "real" shop, without sacrificing the prime consideration of instruction?

In the plan to be described, the main object was to find a middle ground between the common methods employed in the majority of school shops, where the work is wholly educational in character, and the plan adopted at a few institutions where, with the aid of skilled paid journeymen, a commercial product is marketed in competition with outside shops. The first of these methods while condensing the instruction in the typical operations of machine practice to a minimum of the student's time and energy, does it by using a carefully planned series of "projects" or models which have absolutely no value when finished except for exhibition purposes or the scrap heap.

How can any student expect to be intensely interested in the production of "play" models to be exhibited on graduation day,

and immediately afterwards consigned to the junk pile or worked down to smaller 'dimensions for a similar exercise for the classes to follow? The commercial element in that sense of power which comes from the useful accomplishment of a real job is entirely lacking and there is no more important factor in the student's interest in, and attitude toward his work than this. It is such methods doubtless that account largely for the "lukewarm" attitude of indifference toward school-shop work, taken by many students who have in them the making of skilled and efficient mechanics.

The main objection to the methods of school shops, where a commercial product is put into competition with the open market, is that while the students can perform certain simple operations of relatively minor importance, only skilled journeymen can give to the finished machine that certain and sure touch that distinguishes professional from amateur efforts and real shop results from those of the school. While such a plan as this is doubtless superior to the first method, there will always be a tendency, if the shop is to be even approximately self-sustaining, toward sacrificing the instruction for the benefit of the commercial side and this defeats the true object of the school shop.

The following plan for machine shop practice has been in successful operation for the past six months at the Lowell Textile School, Lowell, Mass. The shop practice is considered a most important adjunct to the specialized technical training in the textile industry given at this school, and the character of the instruction in this branch as well as all others is of the most practical character possible. This work is given in the department of textile engineering and is allied closely to the construction and repair of textile machinery. This instruction is given in both day and evening courses, the evening classes are free for residents of the city. The features of the plan to be particularly noted are those involving the co-operation of a commercial shop—the Kitson Machine Shop, Lowell, Mass. This shop builds high-grade textile machinery and is one of the most progressive concerns in the city.

The principal points may be briefly summarized as follows:

(a) The school purchases from the shop at the regular price per pound castings or forgings which are carefully selected by the shop superintendent and instructor for their representative value for instruction purposes.

(b) These castings or forgings are graded as to difficulty and represent as far as possible only one or at the most two typical operations.

(c) These castings or forgings are machined and finished in accordance with blue-prints and specifications furnished by the shop and the actual shop methods are followed wherever possible.

(d) The instructor in direct charge of the work is assistant superintendent of the shop proper and is a most competent and experienced man. Arrangements have been made with the shop so that he devotes eight hours per week to the school work, four of which are given to the evening classes.

(e) The finished work, if fully conforming to the requirements of the shop inspection made by the instructor, is returned to the shop and credit is given.

The advantages of this plan when properly carried out with the co-operation of a commercial shop are:

1. A commercial element is introduced into the instruction work, thus holding the student's attention, and the inspection and acceptance of his work furnishes the strongest incentive for careful and painstaking performance.

2. The expense to the school is small, the value of the accepted work offsetting the cost of material and work rejected by inspection.

3. The school-shop equipment must consist of tools adapted for real shop work and not of the type so often found and built for school use solely.

4. The best type of practical instructor is furnished and as he serves only part time, a much higher-grade man than is ordinarily attracted to school shops is available.

5. The expense to the shop is negligible except the time allowed the instructor, and after a sufficient period of co-operation, experimental work of various kinds could be carried on in the school shop which would be of mutual benefit.

It must be understood that this plan is in no way intended to train men for the purposes of this particular shop, nor is the shop a material gainer on the work done, which necessarily is not large in amount or value. The sole object is to give the student as practical training in shop work as possible and create his interest in and for commercial work. Thus far the working of this plan is entirely satisfactory and would seem to be perfectly feasible and practicable wherever broad-minded manufacturers are willing to co-operate with the schools in a similar way.

This article appeared in the *American Machinist*, June 17, 1909.

BULLETIN

OF THE

Lowell Textile School

Lowell, Massachusetts, U. S. A.



ISSUED QUARTERLY

Entered Aug. 26, 1902, at Lowell, Massachusetts
as second-class matter under Act of
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Moody Street and Colonial Avenue

FOR BULLETIN AND TERMS ADDRESS CHAS. H. EAMES, PRINCIPAL

The Progress of the School

Each year the history of the Lowell Textile School has been marked by advancing steps in the progress of the school. These have been distinguished by an increase in the enrollment, by additions to the equipment, by increasing the floor space, and by the addition of new instructors and branches of study which give strength and value to the curriculum.

The school year of 1908-9 was no exception to the rule. The registration in the day classes reached the highest number on record being an increase of over 33 1-3% above the registration of 1907-08, and believing that the next year would show a gain also, plans were made for an increase in floor space. The appropriation of \$12,000. by the Massachusetts Legislature has made it possible to carry out the plans of adding a second story to the Falmouth Street Building and Boiler House. This work will be practically finished by the opening of the coming school year, and the result will be considerable more room for the Textile Design Department in the shape of more and larger class rooms, offices, and exhibition rooms. More room will also be available for the Hand Loom section of this department. The arrangement will further facilitate the work of this department by bringing the Designing section nearer the Power Weaving. Additional class, lecture, and drawing rooms in Southwick Hall will result from this change and will be appreciated by the other departments of the school.

The equipment of the school has been increased by the addition of a four bank ribbon loom and a new Jacquard loom for brocade work. Both looms are made by the Crompton & Knowles Loom Works.

Two machines have been added to the Knitting Department—a New Automatic Hosiery Machine and a Ribbed Underwear Machine from Scott & Williams of Philadelphia, Pa. This de-

partment has required more floor space due to the steadily increasing number of machines and the enlargement made during the summer will be appreciated by all students taking this course.

A steam turbine with electrical generator has been added to the Engineering Laboratory. The unit consists of a seven stage Kerr Steam Turbine direct connected to a special 25 K. W. alternating current generator. This unit is for experimental and testing purposes, and for the control of the generator there is provided a Westinghouse switchboard panel having standard modern instruments and apparatus to facilitate the great variety of tests.

From Curtis & Marble there has been received a three burner gas singeing machine for worsted and cotton goods. This forms a valuable addition to the equipment of the Finishing Department. The increase in the number of students taking work in experimental dyeing has necessitated the installation of additional dye-baths of special design. New machines are arranged for the work in bleaching, thus increasing the present equipment of dyeing machines in the basement of Southwick Hall. Special apparatus has been purchased for work in the examination and analysis of color problems.

While the importance of the physical training and development as well as the mental training of the student has not been forgotten, in the past we have been able to offer nothing more than some physical apparatus in the gymnasium, and a campus for base-ball and foot-ball. This year it is hoped to have a physical director of experience and training, and it is further proposed to require all students before entering upon any physical training to submit to a rigid physical examination by a competent and reputable physician. Thus it is hoped to prevent as far as possible any injury to a student due to his engaging in physical exercise which might be beyond the power of his endurance.

It is the object of the management of the school to so train the young men that they may enter the textile industry with strong bodies as well as strong minds, thereby adding with each graduate permanent and growing strength to that industry.

Various changes have been made in the instructing staff due to resignations. The new instructors bring, however, new life

and will add much strength to the various departments. In the Chemistry Department Mr. Miles R. Moffat, S. B., Columbia, and late chemist of the Atlantic Mills of Providence, R. I., comes as instructor in Quantitative Analysis and in the same department Howard D. Smith, Ph. D., Tufts, '06, and Brown University, '04, comes with several years experience at Beloit College, to give the instruction in General Chemistry and Physical Chemistry.

In the Cotton Department Mr. Herbert C. Wood, a graduate of the Lowell Textile School, 1906, takes the place of Mr. James G. Coman, resigned. Mr. Wood has had several years of particularly valuable experience and with his technical training should add to the strength of the Cotton Department.

In the Design and Weaving Department Mr. Starr H. Fiske, Lowell Textile School, 1909, enters as assistant instructor, vice John R. Walmsley, resigned.

Mr. Harold Nickerson, S. B., Harvard University and a special student at Howard Walker's Design School, takes charge of the Decorative Art Department, vice Eugene W. Clark, Jr., resigned.

The work in English and the Commercial Languages has grown to such an extent that arrangements have been made to have a resident instructor in these subjects. We feel that the school is fortunate in securing for this work Mr. John Clement, A. B., Harvard University.

BULLETIN

OF THE

Lowell Textile School

Lowell, Massachusetts, U. S. A.



ISSUED QUARTERLY

Entered Aug. 26, 1902, at Lowell, Massachusetts
as second-class matter under Act of
Congress, July 16, 1894

Moody Street and Colonial Avenue

FOR BULLETIN AND TERMS ADDRESS CHARLES H. EAMES, PRINCIPAL

Technical Industrial Education

With the increasing interest and progress in the establishment of systems and schools for the promotion of industrial education there have been many plans suggested, many theories advanced, and many points of view taken. In the investigation and researches which have been made this school has been under the eyes of many observers. Its brief history has been followed from its beginning and its progress and results have been the source of much interest and study. Throughout its history the plan of the work has been shaped toward one definite goal with one definite purpose, best expressed by the words of the act of incorporation—"to give instruction in the theory and practical arts of textile and kindred industries."

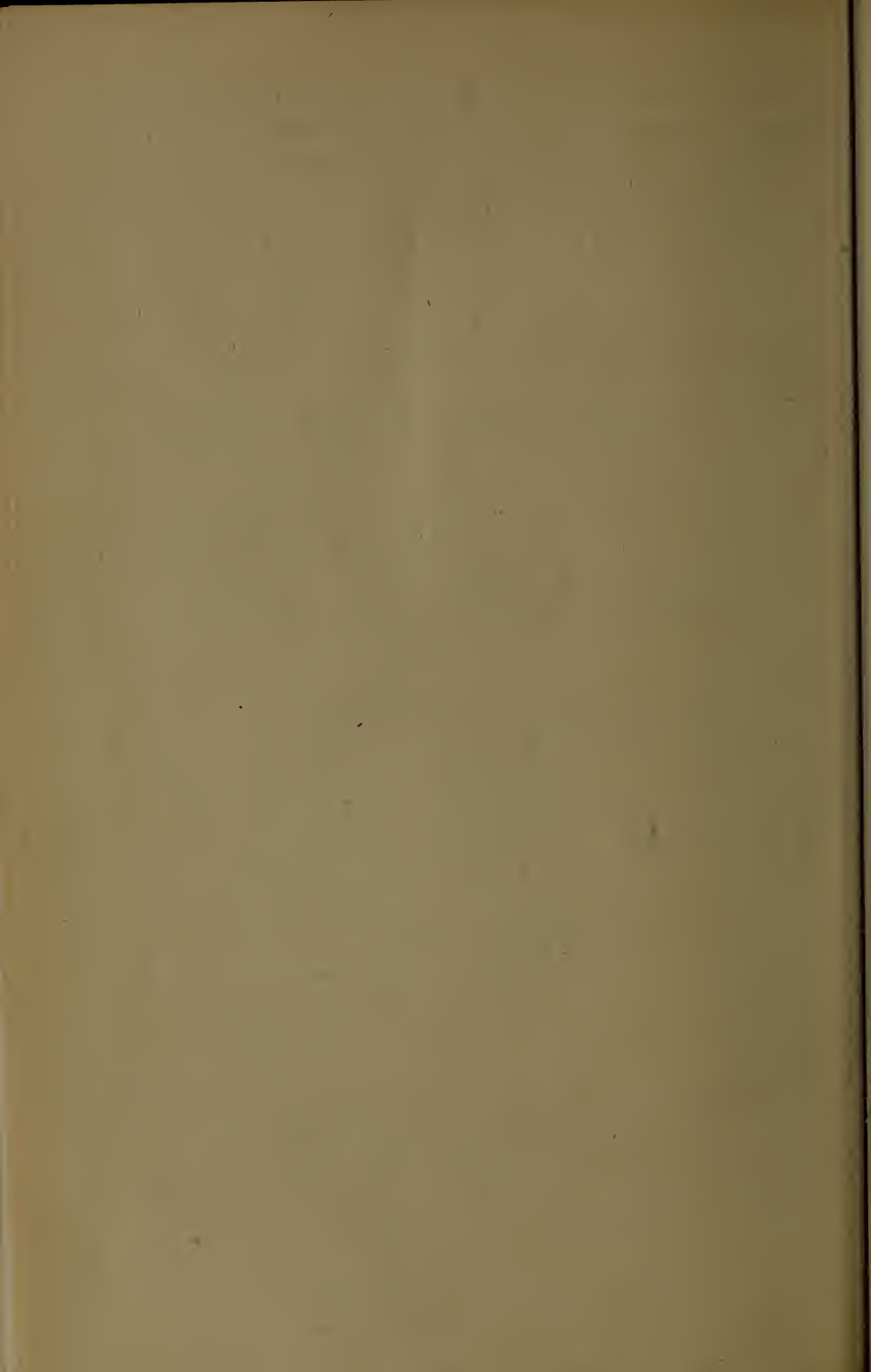
The incorporators had in mind instruction for both those who were already employed in the industry and had only a limited knowledge of it, and for those who desired to enter the industry but who had no previous training in the textile arts. For the first have been arranged the evening courses which are so planned that one may pursue a course of study in the particular branch in which he is engaged during the day, or he may take a course which will give him information and training in a department of the work with which he is more or less associated and a knowledge of which would assist him in his own daily work. Furthermore by pursuing several of these courses for several years he can acquire a knowledge of all the processes which go to make up a textile manufactory and thus be able to perform his particular part with better intelligence and to advance to a better position.

On the other hand the young man who can spend three or four years, concentrating all of his efforts in acquiring the fundamental principles and a knowledge of their application has

presented to him courses of study which prepare him to enter his chosen industry. These have been designated as Cotton Manufacturing, Wool Manufacturing, Textile Designing, Chemistry and Dyeing, and Textile Engineering Courses. Each course while aiming to give specialized training for a particular vocation is also planned to give that breadth of training which becomes a requisite in order that a young man may intelligently meet the varied duties of his successive positions. It is realized that many of the problems which he is called upon to solve in later life may be other than of a purely technical character.

It is believed that there will always be an opportunity for one who has this training, for by virtue of it he is able to adapt himself to the changing demands and conditions. With the foundation he has laid, together with such assets as he acquires from experience, he should be able to fill each successive progressive position in a way that he could not without this training. Further it is reasonable to assume that there will be an opportunity for all who are intelligently trained, for those who can assume and carry responsibility and who can meet the varied demands of the positions.

While work for which the courses prepare is of a specialized character, it is not to be supposed that the student must inherit some particular skill or taste for textile work. Probably the great majority of the successful graduates have come from families that have never been engaged in the manufacture of textiles. The school is for anyone and for all having the proper educational preparation. The industry needs well trained, industrious, and progressive young men, therefore there should be no question concerning the opportunities for progress.



The Commonwealth of Massachusetts.

ANNUAL REPORT OF THE TRUSTEES OF THE LOWELL TEXTILE SCHOOL.

To the Honorable Senate and House of Representatives of the Commonwealth of Massachusetts in General Court assembled.

The trustees of the Lowell Textile School of Lowell, Mass., respectfully submit the following report for the calendar year 1909, in compliance with chapter 248, Acts of 1904, which provides: —

SECTION 1. The trustees of every textile school receiving financial aid from the commonwealth shall, on or before the thirtieth day of January in each year, make to the general court a report containing a concise statement as to the buildings, equipment and resources of the school, the courses and methods of instruction, the number of teachers and students during the previous calendar year, and the number of students, if any, who graduated therefrom. The report shall also contain a statement, verified by the oath of the treasurer of the school, and in such form as the auditor of accounts of the commonwealth shall prescribe, showing separately the amounts received during the previous calendar year from tuition fees, from the commonwealth, from any city or town, and from all other sources, and also showing the expenditures of the school during the same period, under the heads of maintenance, construction, and new equipment, and also the financial condition of the school at the close of said year.

LOWELL TEXTILE SCHOOL.

STATEMENT OF THE TREASURER.

MAINTENANCE ACCOUNT.

Paid for teacher's salaries,	\$32,490 60	
for administration salaries,	5,651 10	
for employees' salaries,	6,108 64	
for general expense,	9,918 09	
supplies,	4,713 57	
for power and light,	4,570 45	
for special service,	439 43	
for chemistry deposits,	857 38	
for insurance,	2,956 35	
for refund of tuition,	20 00	
	<hr/>	\$67,725 61
Deduct ledger debits as follows : —		
Cash from chemistry deposits,	\$3,530 71	
from supplies, books sold,	2,371 31	
from special service,	508 59	
from stock sold,	126 83	
from use of telephone,	8 93	
from rebate on insurance,	1,912 50	
	<hr/>	8,458 87
Net cost of maintenance for 1909,		\$59,266 74
Cash from Commonwealth of Massachusetts,	\$35,000 00	
from city of Lowell,	8,000 00	
from tuitions,	18,969 52	
	<hr/>	61,969 52
Balance available for other purposes brought down,		\$2,702 78
Amount paid for new equipment,		2,714 99
		<hr/>
Deficiency,		\$12 21
		<hr/>

Special accounts, the expenditure of which were met from specific appropriations or from loans : —

NEW EQUIPMENT ACCOUNTS.

Machine Shop, Engineering and Mechanism Account.

Cash on hand Jan. 1, 1909,	\$370 44	
Amount expended during 1909,		\$285 32
Balance on hand Jan. 1, 1910,	\$85 12	

Chemistry and Dyeing Equipment Account.

Cash on hand Jan. 1, 1909,	\$557 02	
Amount received from the Commonwealth (chapter 129, Resolves of 1909),	3,000 00	
	<hr/>	
Total,	\$3,557 02	
Amount expended during 1909,		2,070 39
Balance available Jan. 1, 1910,	\$1,486 63	

Textile Machinery Equipment Account.

Cash on hand Jan. 1, 1909,	\$149 80	
Amount expended during 1909,		\$137 85
Balance on hand Jan. 1, 1910,	\$11 95	
Amount paid for new equipment from general account brought down,		2,714 99
Total paid for new equipment,	\$5,208 55	

CONSTRUCTION ACCOUNTS.

Falmouth Street Building.

Amount received from Commonwealth (chapter 129, Resolves of 1909),	\$15,000 00	
Amount thereof expended during 1909,		\$14,628 97
Balance on hand,	\$371 03	
Amount expended in partitioning off for class rooms the upper floor of Falmouth Street head house, payable from loans,		600 00
Total expended for construction,	\$15,228 97	

SUMMARY OF RECEIPTS AND EXPENDITURES.

	Received.	Paid.
Cash on hand Jan. 1, 1909,	\$1,437 93	—
Maintenance, general receipts,	61,969 52	\$67,725 61
Maintenance, miscellaneous receipts,	8,458 87	—
Machine shop, engineering and mechanism,	—	285 32
Chemistry and dyeing,	3,000 00	2,070 39
Textile machinery equipment,	—	137 85
New general equipment paid from balance from maintenance account,	—	2,714 99
Construction,	15,000 00	15,228 97
	\$89,866 32	\$88,163 13
Loans,	35,000 00	35,000 00
Cash on hand Jan. 1, 1910,	—	1,703 19
	\$124,866 32	\$124,866 32

FINANCIAL CONDITION, DEC. 31, 1909.

Assets.

Land,	\$105,639 09	
Buildings,	255,227 14	
Machinery and equipment,		\$360,866 23
Supplies,		219,080 62
Cash Jan. 1, 1910,		13,526 56
		1,703 19
		\$595,176 60

Liabilities.

Loans,	48,500 00
Surplus of assets,	\$546,676 60

LOWELL TEXTILE SCHOOL.

SPECIAL TRUST FUND ACCOUNTS.

Book Prize Fund.

Contributed by Prof. Louis A. Olney for prizes of books to honor students in chemistry and dyeing :—

Balance on hand Jan. 1, 1909,		\$2 53
Cash received,		60 00
Amount of prizes awarded June, 1909,		\$60 00
Balance on hand Jan. 1, 1910,		\$2 53

Library Fund.

Contributed,		\$55 00
Contributed,		100 00
		<hr/>
		\$155 00
Expended for reference books,		\$155 00

To the Trustees of the Lowell Textile School.

This is to certify that I have examined the account of the Lowell Textile School for the year 1909, and find the entries correctly made and tabulated and sustained by proper vouchers.

EDWARD W. PEASE,
Auditor for the Corporation.

LOWELL, MASS., Jan. 11, 1910.

LOWELL, MASS., Jan. 29, 1910.

I certify that the foregoing is a correct statement of the receipts and expenditures on account of the Lowell Textile School during the calendar year 1909, and of the financial condition of the corporation at the close of said year.

ARTHUR G. POLLARD, *Treasurer,*
Trustees of the Lowell Textile School.

MIDDLESEX, SS.

LOWELL, MASS. Jan. 29, 1910.

Subscribed and sworn to before me this day.

GEORGE R. CHANDLER,
Justice of the Peace.

Approved as to form.

WM. D. HAWLEY, *Deputy Auditor.*

STATEMENT AS TO BUILDINGS, EQUIPMENT, RESOURCES, ETC.

LAND.

Land bounded by Standish, Riverside and Moulton streets, and Merrimack River and Colonial Avenue, about 18 acres,	\$105,639 09
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SCHOOL BUILDINGS.

Southwick Hall: 80 by 265 feet; three stories, with two-story wings and finished basement under all; cost,	\$142,120 30
Kitson Hall : 63 by 184 feet; one story, with basement; cost,	31,390 91
Boiler house : 63 by 68 feet ; one story ; cost,	14,875 16
Falmouth Street building : 80 by 192 feet; three stories, with basement; cost,	66,840 77
Total cost of buildings,	<hr/> \$255,227 14 <hr/>

The floor space is divided between the departments and offices as follows: —

	Square Feet.
Cotton yarns,	12,000
Woolen and worsted yarns,	20,960
Decorative art,	1,446
Textile design,	15,360
Chemistry and dyeing,	20,000
Power weaving,	15,360
Finishing,	5,806
Mechanical and electrical engineering,	15,729
Power plant,	5,000
Administration,	2,930
Assembly and physical culture halls,	10,800
Entrances, corridors, stairways, toilets, store and locker rooms,	14,487
Total floor space in all buildings,	139,878

Cost per square foot of floor space,	\$1 82
------------------------------------------------	--------

EQUIPMENT.

Cotton yarn department,	\$28,767 59
Woolen and worsted yarn department,	41,638 07
Design department,	11,067 31
Decorative art department,	1,181 73
Chemistry and dyeing department,	20,204 65
Power weaving department,	17,812 80
Engineering department,	17,349 23
Physical laboratory and class room,	1,708 91
Finishing department,	13,405 51
Corridors,	210 50
Trustees' room,	881 40
Lecture hall,	491 86
General office,	646 60
Principal's office,	722 05
Janitor's rooms,	396 98
Lunch room,	222 18
Store room,	223 75
Library,	2,497 63
Locker room,	596 00
Students' room,	176 60
Physical culture apparatus,	367 33
Southwick Hall, heating, sprinkling and electrical system,	11,495 79
Kitson Hall, heating and sprinkling system,	1,326 90
Falmouth Street building, heating and sprinkling system,	4,466 80
Power plant,	24,648 00
Miscellaneous equipment pertaining to all buildings and departments,	16,574 45

Total equipment,	\$219,080 62
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The increase in value of equipment is : —

Purchased,	\$5,208 55
Contributed,	2,956 11

Total increase,	\$8,164 66
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RESOURCES.

Value of land brought forward,	\$105,639 09
Value of buildings,	255,227 14
Value of equipment,	219,080 62
Value of supplies, per inventory,	13,526 56
Cash on hand Jan. 1, 1910,	1,703 19
	<hr/>
	\$595,176 60
Estimated revenue from tuition, 1910,	20,000 00
	<hr/>
Total,	<u>\$615,176 60</u>

COURSES OF INSTRUCTION.

CLASSIFICATION OF DAY STUDENTS, BY COURSES.

	First Year.	Second Year.	Third Year.
Cotton manufacturing,	14	9	4
Wool manufacturing,	26	8	10
Textile design and decorative art,	6	8	8
Chemistry and dyeing,	30	22	12
Textile engineering,	12	4	7
Special course,	2	1	1
	<hr/>		
	90	52	42
	<hr/>		
Total,			184

CLASSIFICATION OF EVENING STUDENTS, BY COURSES.

	First Year.	Second Year.	Third Year.	Fourth Year.
Cotton spinning,	44	16	—	—
Woolen and worsted spinning,	30	4	5	—
Designing,	52	10	12	—
Chemistry and dyeing,	60	10	2	7
Weaving (cotton),	11	—	—	—
Weaving (woolen and worsted),	31	—	—	—
Weaving (dobby and Jacquard),	11	—	—	—
Mechanics,	135	—	—	—
Steam engineering,	—	25	—	—
Electricity,	—	—	18	—
Mechanical drawing,	40	—	—	—
Machine drawing,	—	17	6	1
Architectural drawing,	14	1	4	1
Freehand drawing,	17	2	4	—
Machine shop,	18	5	—	—
Mathematics,	16	—	—	—
Finishing,	16	—	—	—
	<hr/>			
	495	90	51	9
	<hr/>			
Total,				645
Names counted twice,				56
	<hr/>			
Net total,				589

While there are more evening courses than day, and they are necessarily shorter, the demands of the evening applicants who are daily familiar with the make-up and operation of the machinery of production are largely for instruction in the theory of the art, — the “why” of what they do daily, in order that they may more quickly and intelligently meet the requirements of steady improvements in machines and processes, and thus broaden their field of usefulness.

Our annual catalogue shows the progress of the evening pupils. Several have reached the highest positions in the industry, though previous to entering our classes they had had long experience in the mills and shops, and established a reputation therein.

While we have successfully established and developed a school that in our specialties takes rank with the higher technical schools, it must not be inferred that we do not offer to the humblest youth an equal opportunity to obtain the smallest morsel of instruction his modest ambition may desire. If he simply wishes to learn, in trade school fashion, how to operate but one machine, that opportunity is offered him. We simply have few such applications, as the evening pupils crowd our lecture rooms — especially the engineering — in some one of the numerous divisions thereof.

The great danger of the higher technical schools is the tendency to become too entirely academic. We have guarded against this tendency by anchoring our institution, through the character of its management and the variety of our pupils coming from all grades of employment, so that such a happening here is hardly possible.

Once a pupil of the school, always a pupil, is the rule we inculcate. We follow the progress of our graduates annually in practical life, and modify our methods or broaden our curriculum as their experience indicates is desirable. We encourage them to send us the problems which they meet with, and such demands on our instructors are gladly received. We desire them to keep in touch with the progress of the school, and grant them without charge an opportunity to inform themselves of improved machines or processes as they are taken up at the school for instruction.

INSTRUCTORS.

NUMBER BY DEPARTMENTS.	
Cotton yarn,	3
Woolen and worsted yarn,	4
Textile design and power weaving,	6
Chemistry and dyeing,	7
Textile engineering,	4
Decorative art,	2
Finishing,	1
Language and history,	1
Physical culture,	2
Total,	30
Average number of students per instructor,	26

ROSTER OF SCHOOL OFFICERS AND INSTRUCTORS.

PRINCIPAL.

Charles H. Eames, S.B., Massachusetts Institute of Technology, 1897. Experience : secretary of the Lowell Textile School and instructor in electrical engineering and mathematics. Superintendent, Light, Heat and Power Company, Lowell, and engineer with Stone & Webster, electrical engineers, Boston, Mass.

INSTRUCTORS.

Textile Engineering.

George H. Perkins, S.B., chief instructor. Massachusetts Institute of Technology, 1899. Associate member American Society of Mechanical Engineers. Experience : draftsman, Ludlow Manufacturing Company, Ludlow, Mass.; Lockwood, Greene & Co., Boston, Mass.

Herbert J. Ball, S.B., instructor in mechanical engineering. Massachusetts Institute of Technology, 1906.

Ulysses J. Lupien, S.B., instructor in mathematics, physics and electrical engineering. Lawrence Scientific School, 1906. Experience : draftsman, General Electric Company, Lynn, Mass.; with Winston Company, Metropolitan Water Board.

Felix D. Langevin, part time instructor in machine shop practice, Lowell Textile School, and assistant superintendent Kitson Machine Shop, Lowell, Mass. Graduate Lowell Textile School, 1904.

Chemistry and Dyeing.

Louis A. Olney, A.C., M.S., chief instructor. Lehigh University, 1896. Experience : instructor, Brown University; dyeing and finishing departments, Stirling Mills, Lowell, Mass.

Miles R. Moffatt, S.B., instructor in chemistry. Columbia University, 1901. Experience : assistant instructor in physics, Columbia University; chemist, Mallinckrodt Chemical Works, St. Louis, Mo.; chemist, Atlantic Mills, Providence, R. I.

Robert R. Sleeper, instructor in dyeing. Lowell Textile School, 1900. Experience: Read, Holiday & Sons, Limited, New York City; H. A. Metz & Co., New York City.

Howard D. Smith, Ph.D., instructor in chemistry. Tufts College, 1906; Brown University, 1904; Rhode Island College, 1901. Experience: assistant instructor, Brown University, Tufts College; instructor Beloit College, Wisconsin.

George A. Cushman, A.M., assistant instructor in chemistry. Harvard College, 1907.

George W. Hathorn, assistant instructor in dyeing. Lowell Textile School, 1907. Experience: New England Gas and Coke Company, Everett, Mass.

Walter E. Hadley, assistant instructor in chemistry. Lowell Textile School, 1908.

Decorative Art.

Harold Nickerson, S.B., chief instructor. Harvard University, 1905; honor graduate School of Design, Boston Museum of Fine Arts, 1906. Experience: Little & Brown, architects, Boston, Mass.

Elizabeth Whitney, instructor in freehand drawing. Normal Art School, Boston, 1882. Pupil of Dr. Denman W. Ross, lecturer in design, Harvard University. Experience: teaching, fifteen years.

Textile Design and Power Weaving.

Fenwick Umpleby, chief instructor. Honor graduate, textile department, Victoria College, Leeds, Eng., 1884. Experience: James Lees & Sons, Bridgeport, Pa.; chief designer, George H. Gilbert Manufacturing Company, Gilbertville, Mass.; and Globe Manufacturing Company, Utica, N. Y.

Arthur F. Ferguson, instructor in textile design and cloth analysis. Lowell Textile School, 1903. Experience: Chapman, Kendal & Daniels, wholesale dry goods, Boston, Mass.

Stewart Mackay, instructor in hand loom weaving. Lowell Textile School, 1906

Joseph Wilmot, instructor in power weaving and warp preparation. Lowell Textile School, 1908. Experience: United States Bunting Company, Lowell, Mass.

Albert E. Musard, instructor in Jacquard weaving. Experience: Oldham Mills, Philadelphia, Pa., and Paterson, N. J.; Gloucester Rug Mills, Gloucester City, N. J.; Binder & Ellis, Philadelphia, Pa.

Starr H. Fiske, assistant instructor in cotton power weaving. Lowell Textile School, 1909.

Cotton Yarn.

Stephen E. Smith, chief instructor. Lowell Textile School, 1900. Experience: draftsman, Lowell Machine Shop, Lowell, Mass.; Atlantic Cotton Mills, Lawrence, Mass.; Shaw Stocking Company, Lowell, Mass.

Herbert C. Wood, instructor in cotton yarns. Lowell Textile School, 1906. Experience: Tremont and Suffolk Mills, Lowell, Mass.; Whitin Machine Works, Whitinsville, Mass.

Henry K. Dick, instructor in knitting. Experience: Linnville Hosiery Factory, Lanark, Scotland.

Woolen and Worsted Yarns.

Edgar H. Barker, chief instructor. Massachusetts Institute of Technology, 1896. Experience: Pacific Mills, Lawrence, Mass.; E. Frank Lewis, Lawrence, wool scouring.

John N. Howker, instructor in wool sorting and scouring. Technical School of Saltaire, near Bradford, Eng.: certificate from City and Guilds of London. Experience: Saltaire Mills, Yorkshire, Eng.; Goodall Worsted Company, Sanford, Me.; Arlington Mills, Lawrence, Mass.

- Henry H. Crompton, instructor in worsted yarns. Lowell Textile School, 1899.
Experience: Arlington Mills, Lawrence, Mass.
- Eugene C. Woodcock, instructor in woolen yarns. Lowell Textile School, 1907.
Experience: Wood Worsted Mills, Lawrence, Mass.

Finishing.

- Arthur A. Stewart, chief instructor. Lachine Academy, Canada; Lowell Textile School, 1900. Experience: Dominion Woolen Manufacturing Company, Montreal, Can.; American Woolen Company Mills; Nonantum Worsted Mills, Newton, Mass.; instructor, woolen and worsted yarns, Lowell Textile School.

CULTURAL COURSES.

Languages and History.

- John Clement, A.B., instructor in commercial languages, English and history, Harvard College, 1894. Experience: reporter, Boston Evening Transcript; manager, Lamson, Wolfe & Co.; publishers, Boston; editorial staff, Charles Dudley Warner's Library of the World's Best Literature, New York; International Library of Famous Literature, New York; teacher, Ballou and Hobigand Preparatory School, Boston.

Physical Culture.

- Charles R. Church, physical director. Lowell Textile School, 1906; Dr. Sargent's School, Cambridge, Mass.
- Archibald R. Gardner, M.D., medical adviser. Harvard University, 1902.

Several changes during the year have been made in this roster, as follows: —

Felix D. Langevin, assistant superintendent Kitson Machine Shop, was appointed part time instructor in machine shop practice.

Miles R. Moffatt, A.B., Columbia, 1901, as instructor in chemistry, succeeded John B. Reed, appointed to the Bureau of Chemistry, Department of Agriculture, at Washington City.

Howard D. Smith, Ph.D., Rhode Island College, 1901, Brown, 1904, and Tufts, 1906, as instructor in chemistry, succeeded Walter B. Pope; also appointed to said Bureau of Chemistry.

Harold Nickerson, S.B., Harvard, 1905, and School of Design, Boston Museum of Fine Arts, succeeded E. W. Clark, Jr., resigned.

Starr H. Fiske, Lowell Textile School, 1909, as assistant instructor in power weaving, succeeded John R. Walmsley, resigned to accept a position at the Butler Mills, New Bedford.

Herbert C. Wood, Lowell Textile School, 1906, as instructor in cotton yarns, succeeded James G. Coman, resigned to return to Mississippi.

The departments of history and languages were consolidated and placed in charge of John Clement, A.B., Harvard, 1894, *vice* Paul E. Kunzer, Ph.D., and Frederick A. Wood, Ph.D., part time instructors, resigned.

Charles R. Church, Lowell Textile School, 1906, and Harvard School of Physical Culture, was appointed physical director; and Archibald R. Gardner, M.D., Harvard, 1902, medical adviser.

NUMBER OF STUDENTS.

Jan. 1, 1909: —

Day classes,	.	.	.	.	.	.	.	.	.	.	173
Evening classes,	.	.	.	.	.	.	.	.	.	.	505
											<hr/>
Total,	.	.	.	.	.	.	.	.	.	.	678

Graduated: —

Day classes,	.	.	.	.	.	.	.	.	.	.	20
Evening classes,	.	.	.	.	.	.	.	.	.	.	66
											<hr/>
Total,	.	.	.	.	.	.	.	.	.	.	86

Jan. 1, 1910: —

Day classes,	.	.	.	.	.	.	.	.	.	.	184
Evening classes,	.	.	.	.	.	.	.	.	.	.	589
											<hr/>
Total,	.	.	.	.	.	.	.	.	.	.	773

METHODS OF INSTRUCTION.

Some reference to the character and purpose of this school as contrasted with that of other of the higher educational institutions, here seems necessary. We repeat that it is a business school, established and managed by a board of business men representing the textile and textile machine industries. The manufacturer buys only such raw materials as will make the fabrics and machines that the market will take, — that there is a demand for. We apply this rule in the reception of pupils, as far as possible. The school was instituted to meet the demand of the industries to which it caters for employees thoroughly trained in the “theory and practical art of textile and kindred industries.” Hence we do not desire to matriculate or retain pupils who will not “acquit themselves like men” in these industries. Although from a rigid observance of this rule we may temporarily lose revenues, we know that the steady growth of our roster is mainly due to the record our graduates are making

in the mills and shops, commercial houses, etc., as statistics herewith indicate.

That we may not waste public revenues, private contributions or pupils' fees on those who have not the ambition, will-power and perseverance to make themselves valuable acquisitions to our industrial concerns, we require evidence that applicants have availed themselves of the free opportunities for preparatory instruction afforded elsewhere. An applicant for day instruction must present a certificate of graduation from at least a high school or academy, or pass an equivalent examination; and an evening pupil must present such a certificate from at least an evening grammar school, or pass an equivalent examination. Our excellent evening schools are free to all, and we do not intend to duplicate their work.

Some years ago we offered evening instruction to any applicant who understood English, and the roster reached 588. The attendance was very irregular. The following year we required certificates, or the passing of a satisfactory examination, and the roster shrunk to 430. We have now 585, all of whom have complied with the above rule, and there is greater regularity of attendance, and we hold through the school year a much larger number of those who matriculate.

Apparently we have solved the problem of industrial education so far as it relates to those who have the ambition and will-power to improve their opportunities, and those in whom these qualities may be aroused and developed by the advancement of their associates. Outside of these classes are those who work from necessity alone. The experience of foreign countries and of great trade schools of this country is that attendance at school can only be had by holding out inducements to the applicants, or by making it compulsory. The German States generally make attendance compulsory for the younger pupils of this latter class, or offer to the older a shorter term of compulsory military service. In this country the most successful trade schools avail themselves of the statutes providing for apprenticeship.

We do not reach this class of pupils. Whether when maturing they can most certainly be worked up into efficient operatives, working under the eye and at the direction of a scientifically

and practically trained sub-superintendent of the mills and shops, or by instruction in a free trade school, with attendance perhaps made compulsory, is a problem that many are struggling to solve. Where the will-power and ambition are wanting, it must be provided.

But for the above-stated requirements for matriculation referred to, applicants would crowd our school by thousands at the opening of a term, only to shrink to a low minimum by mid-term.

Further, we offer no free scholarships to day students. In lieu thereof, a student who has attended for one year and paid therefor and passed a creditable examination may, on satisfactory proof of indigence, have credit for the remaining two years on filing a bond with two satisfactory sureties that he will pay the amount in easy installments after graduation. We rarely have an application for this privilege. Thus we take security that the applicant is worthy of our consideration.

This school was at first proposed to the late President Walker as a department of the Massachusetts Institute of Technology, education in the theory and practical art of textile manufacture — the leading industry of the Commonwealth — not being provided for by that world-famous institute. The proposition was received with much favor, and several conferences were had. But the needs of existing departments were so pressing that no assurance could be given of early action. Meanwhile, southern competition was threatening. Several of the oldest and largest of our cotton mills had gone into liquidation, and several more were establishing large plants in the south to continue the manufacture of the coarser fabrics, the trade marks of which were of wide repute, in the eastern Asiatic markets especially. It was under these conditions, and a general demand to go into higher and finer varieties of fabrics requiring higher skill and a more thorough application of the sciences that could be profitably applied to such manufactures and the more complex machinery and processes, that an association was formed of the leading representatives of the mill and shop corporations of Boston having mills and shops on the Merrimack River and its tributaries, for the establishment of a school of the character proposed to the institute. The act (chapter 475 Acts of 1895)

under which we are incorporated provides for such a school, and that provision has been rigidly adhered to.

There was an ample supply of graduates of the higher scientific schools thoroughly educated in the sciences applicable to our industries, and an abundance of experienced mill men trained in the practical art of making the coarser fabrics at least, but a dearth of those who combined in themselves both knowledge of the theory — the sciences — and the practical art. We assembled our first corps of instructors in the sciences from the bright graduates of the higher scientific schools — largely from the Massachusetts Institute of Technology — and from among the experts in the practical art from the mills and shops. Those coming from the scientific schools were familiar with the methods of instruction at their school. Each class learned from the other, until, with some changes in personnel, we have developed a thoroughly able, efficient and harmonious corps of instructors, whose good work is made evident by the rapidity with which our graduates are taken up by the mills and shops, and their rapid advancement therein.

The entering day class — freshmen — have for their first term general instruction in all courses. At the beginning of the second term each student chooses one of the five regular three-year courses. Unless a special student, he continues to give some time to each course, but mainly to that he has chosen and in which he seeks to graduate. While the method varies somewhat, instruction is at first in the sciences, — the theory of the art, — by lectures, blackboard illustration, drawing, models, etc. The practical art is gradually introduced, and the three-years course closes with thorough instruction in this art. Economies are everywhere practised. An instance: for practice work in our machine shop, instead of working on metals that go finally to the scrap heap, we purchase from a leading shop rough castings intended for parts of commercial machines. Our pupils clean, file, plane, thread, mill, punch or bore these, as required, and they are returned finished to the shop, when, after a rigid and critical inspection, we receive back the original purchase money and pay for the work done. None have failed thus far to pass inspection. The interest of the pupil is greater when he knows he is making a part of a commercial machine, than when working for the scrap heap.

In chemistry and dyeing there is first thorough instruction in general chemistry, qualitative, quantitative analysis, stoichiometry or chemical mathematics, advanced organic and inorganic chemistry, physical chemistry, and in all varieties of fibers, followed by thorough instruction in dyeing, first in the laboratories and then on commercial machines, vats, kiers, etc. A growing side line is the manufacture of dyes, for which we and the rest of the world are so dependent upon Germany.

That the school has passed the stage of experiment, and has now justified the faith of those who have sustained us so far, will appear from the following statement of the positions our graduates have attained:—

POSITIONS ATTAINED BY GRADUATES OF DAY COURSES SINCE GRADUATION,
BROUGHT UP TO OCT. 1, 1909.

Principal of textile school or department,	3
Teacher industrial school,	13
Mill corporation treasurer,	2
Mill agent,	4
Mill superintendent,	11
Mill assistant superintendent,	9
Mill assistant manager,	2
Mill foreman of department,	18
Mill purchasing agent,	1
Mill auditor and accountant,	5
Textile designer,	30
In commission house,	13
Electrician,	2
Assistant engineer,	2
Draftsman,	2
Chemist and dyer,	30
In business, textile distributing or incidental thereto,	31
Journalist,	2
Student,	5
Deceased,	2
Machinist,	2
Physical director,	1
Weaver,	1
Minor positions,	4
Not employed,	2
Total,	197

As indicated by the foregoing table, our graduates are not found only in the mills and shops of manufacture. They are fitted for and occupy lucrative positions in mill construction, mill accounting offices, as style makers, buyers and sellers of raw stock, yarns, fabrics, dyes, chemicals, etc.. of the leading

textile importing and distributing dye and chemical houses of New York and Boston, and in the national customs and agricultural departments. We advise them to enter employment in the minor positions, and thus become familiar with every detail of experience that their chosen career affords, before aspiring to advanced positions of greater responsibility.

CORPORATION SUPERVISION.

An annual meeting is held in January for the election of officers, reception of annual reports, and the transaction of such other business as may be proposed, not committed to the Board of Directors. Monthly meetings of the trustees, sitting as a Board of Directors, are held at the school. They appoint such agents, school officers and teachers as they find necessary, prescribe their duties and fix their compensation. The president (in his absence the vice-president) presides at all meetings of the corporation and Board of Directors, and performs such other duties and exercises such other authority as the corporation or Board of Directors may from time to time devolve on him. The treasurer is charged with the general care of the pecuniary affairs and concerns of the corporation, he to receive all revenues and make all authorized disbursements. He is required to report receipts and expenditures and financial condition quarterly to the Board of Directors and annually to the corporation. He is also to execute all contracts made by express authority of the corporation or Board of Directors and approved by the president. He, with the president and one elected trustee, composes a finance committee, which passes upon all orders for expenditures and inspects all bills before payment. No expenditure can be made or liability be incurred in excess of money available to meet it except by vote of the Board of Directors at a meeting, in the call for which due notice of the nature of such proposed expenditure or liability is given. The clerk is required to keep a record of all regular and special meetings of the corporation and Board of Directors, notify all members of such meetings seven days in advance, and perform such other duties as the corporation or Board of Directors may require of him. He is a resident trustee, devoting his time to the development work.

In addition to the finance committee, there are general committees of ways and means, building and legislation, and lectures. There is also a sub-committee for each department of the school, composed as far as is practicable of trustees identified in manufacturing with the specific branch of industry to which their department relates. They are to make recommendations to the Board of Directors as to the needs, etc., of their respective departments, and especially as to the new equipment, floor space, etc., and to perform such other duties as the directors may require of them.

The principal of the school is charged with its conduct, and is directly accountable to the Board of Directors, making monthly reports thereto, and such recommendations and special reports as to efficiency, discipline, etc., as in his judgment are required.

CONCLUSION.

Already, as has been shown in the table showing the present employment of our day graduates, the demand upon this school for instructors of industrial schools is considerable. The general establishment of industrial education throughout the Commonwealth will naturally increase this demand. It is to the interest of the Commonwealth that it should, for the value of the return it will receive for the money so spent will depend upon the qualification of the instructors. This normal school business promises to become an important feature of this school.

The sum of capital invested in the textile industry of the Commonwealth is \$233,766,861, as per the last report of the Bureau of Statistics, exclusive of borrowed money and that invested in textile distribution. With that invested in textile machinery it aggregates over one-third of all industrial investments. At the same time, this industry is among the largest, if not the largest sustaining customer of the other industries. It is this industry mainly that gives Massachusetts its pre-eminence as a manufacturing commonwealth. Presumably it is the largest industrial contributor to the revenues of the Commonwealth. The work of this school is directed to increase these revenues through the increase of the prosperity of the industries to which it is confined. It needs only that we be provided with sufficient floor space to accommodate pupils that apply for

instruction to put it on the road to becoming self-sustaining. Like Archimedes, all we ask is room to stand upon to favorably move our industrial world.

Respectfully submitted,

A. G. CUMNOCK,

President.

JAMES T. SMITH,

Corporation Clerk.

LOWELL, MASS., Jan. 29, 1910

APPENDIX.

RESIDENCE OF DAY STUDENTS.

Adams, Mass.,	1	North Andover, Mass.,	3
Amesbury, Mass.,	2	North Billerica, Mass.,	1
Andover, Mass.,	6	Norwood, Mass.,	2
Arlington, Mass.,	1	Pittsfield, Mass.,	2
Beverly, Mass.,	1	Plymouth, Mass.,	1
Blackstone, Mass.,	1	Reading, Mass.,	2
Boston, Mass.,	3	Roslindale, Mass.,	1
Bradford, Mass.,	3	Roxbury, Mass.,	3
Bridgewater, Mass.,	1	Salem, Mass.,	2
Brookline, Mass.,	1	Somerville, Mass.,	4
Cambridge, Mass.,	3	South Acton, Mass.,	1
Chelmsford, Mass.,	1	South Lancaster, Mass.,	1
Clinton, Mass.,	2	Stoughton, Mass.,	1
Concord Junction, Mass.,	1	Wakefield, Mass.,	2
Danvers, Mass.,	1	Ward Hill, Mass.,	1
Dighton, Mass.,	1	Ware, Mass.,	1
Dracut, Mass.,	1	Watertown, Mass.,	2
East Bridgewater, Mass.,	1	Westfield, Mass.,	1
Fitchburg, Mass.,	6	West Roxbury, Mass.,	2
Gardner, Mass.,	1	Winchester, Mass.,	3
Gilbertville, Mass.,	1	Winthrop, Mass.,	1
Grafton, Mass.,	1	Woburn, Mass.,	1
Great Barrington, Mass.,	1	Worcester, Mass.,	2
Groton, Mass.,	4	Alabama,	1
Haverhill, Mass.,	7	Connecticut,	2
Hingham, Mass.,	2	Maine,	6
Jamaica Plain, Mass.,	2	Maryland,	1
Lancaster, Mass.,	1	Michigan,	1
Lawrence, Mass.,	10	New Hampshire,	7
Littleton, Mass.,	2	New Jersey,	2
Lowell, Mass.,	14	New York,	3
Lynn, Mass.,	4	Rhode Island,	6
Malden, Mass.,	9	South Carolina,	1
Mansfield, Mass.,	1	Vermont,	2
Marblehead, Mass.,	1	Wisconsin,	2
Medford, Mass.,	1	Finland,	1
Melrose, Mass.,	2	Japan,	1
Melrose Highlands, Mass.,	1	Mexico,	1
Methuen, Mass.,	1	Philippine Islands,	1
Millville, Mass.,	1		
Newton Highlands, Mass.,	1	Total,	184
North Adams, Mass.,	1		

PREVIOUS EDUCATION, DAY STUDENTS.

High school or preparatory school,	159	Business college,	2
College,	11	Military academy,	1
University,	4	Art school,	2
Worcester Polytechnic Institute,	2	Grammar school,	1
Polytechnic Institute of Finland,	1		
Rindge Manual Training School,	1	Total,	134

RESIDENCE OF EVENING STUDENTS.

Lowell, Mass.,	454	Allston, Mass.,	1
Lawrence, Mass.,	55	Boston, Mass.,	2
Methuen, Mass.,	22	Cambridge, Mass.,	1
Andover, Mass.,	9	Dorchester, Mass.,	1
North Andover, Mass.,	1	Needham, Mass.,	1
Haverhill, Mass.,	3	Shirley, Mass.,	1
North Billerica, Mass.,	9	Tewksbury, Mass.,	1
North Chelmsford, Mass.,	9	Nashua, N. H.,	1
Chelmsford, Mass.,	2	Pelham, N. H.,	3
Collinsville, Mass.,	5		
Dracut, Mass.,	8	Total,	589

PREVIOUS EDUCATION, EVENING STUDENTS.

Grammar school,	313	Lawrence Industrial School,	2
High school or academy (day),	181	Technical school,	3
High school (evening),	52	Textile school,	7
College or university :—		Trade school,	1
Amherst College,	1	Evening drawing school,	6
Brown University,	1	Normal school,	4
Harvard University,	3	Military academy,	1
Norwich University,	1	Massachusetts Nautical Training School,	1
University of Maine,	1	Preparatory school,	4
Coimbra College, Portugal,	1		
	— 8	Total,	589
Business college,	6		

OCCUPATION OF EVENING STUDENTS.

Apprentice,	15	Carder,	5
Assistant foreman,	2	Card grinder,	1
Assistant superintendent,	4	Carpenter,	6
Baker,	1	Cartridge tester,	1
Band boy,	1	Chemist,	5
Barber,	1	Clerk,	43
Beamer,	1	Cloth checker,	1
Blacksmith,	1	Cloth inspector,	2
Bleacher,	4	Coal weigher,	1
Bobbin boy,	1	Collector,	2
Bookkeeper,	8	Color mixer,	1
Box maker,	2	Contractor,	1
Brush maker,	1	Creeler,	1

OCCUPATION OF EVENING STUDENTS — *Concluded.*

Designer,	5	Patrolman,	1
Doffer,	2	Pattern maker,	1
Draftsman,	15	Pattern weaver,	1
Dresser tender,	4	Pentagrapher,	1
Dyer,	8	Percher,	2
Electrician,	19	Plumber,	4
Elevator man,	1	Polisher,	1
Engineer,	3	Rodman,	1
Engraver,	2	Roving hand,	3
Filling carrier,	1	Salesman,	4
Finisher,	2	Sampler,	2
Fireman,	1	Second hand,	25
Fixer,	8	Section hand,	10
Folder,	2	Shipping clerk,	4
Foreman,	3	Shoe worker,	15
Gardener,	1	Slubber,	1
Glazier,	1	Spare hand,	2
Grinder,	2	Spinner,	5
Grocer,	1	Steam fitter,	6
Harness looker,	3	Stenographer,	2
Helper,	8	Student,	56
Hosiery inspector,	1	Superintendent,	2
Knitter,	2	Tailor,	1
Laborer,	3	Teacher,	3
Lathe hand,	1	Tester,	3
Leather worker,	1	Third hand,	9
Lineman,	2	Timekeeper,	2
Loom fixer,	17	Toolmaker,	3
Machinist,	55	Towel cutter,	1
Manager,	2	Tracer,	1
Mason,	1	Trainman,	1
Master mechanic,	2	Transit man,	1
Mechanic,	3	Upholsterer,	1
Metal worker,	3	Warp dresser,	1
Meter inspector,	2	Watchman,	1
Moulder,	1	Weaver,	25
Napper,	1	Wheelwright,	1
Not employed,	19	Wool sorter,	2
Oiler,	5	Yarn hand,	4
Operative,	46	Yarn weigher,	1
Overseer,	6		
Painter,	2	Total,	589

TRUSTEES OF THE LOWELL TEXTILE SCHOOL.

(Incorporated 1895.)

HONORARY TRUSTEES.

FREDERICK FANNING AYER, Esq., New York City.

THE CORPORATION OFFICERS, 1910.

A. G. CUMNOCK, *President.*

JAMES T. SMITH, *Clerk.*

JACOB ROGERS, *Vice-President.*

A. G. POLLARD, *Treasurer.*

TRUSTEES.

On the Part of the Commonwealth of Massachusetts.

Ex-officiis.

HIS HONOR LOUIS A. FROTHINGHAM,
Lieutenant Governor.

DR. DAVID SNEDDEN,
Commissioner of Education.

Appointed by the Governor and Council.

JACOB ROGERS, Lowell, 1912,
Banker.

FRANKLIN W. HOBBS, Brookline, 1910,
Treasurer, Arlington Mills.

On the Part of the City of Lowell.

Ex-officiis.

HON. JOHN F. MEEHAN,
Mayor of Lowell.

A. K. WHITCOMB,
Superintendent of Public Schools.

ARTHUR L. GRAY,
Chairman Board of Aldermen.

VICTOR F. JEWETT,
President Common Council.

By Appointment of the Lowell Textile Council.

MICHAEL DUGGAN.

PERMANENT TRUSTEES.

ALEXANDER G. CUMNOCK, Lowell, Treasurer Appleton Company. Boston corporation, mills at Lowell.

EUGENE S. HYLAN, Lowell, Treasurer, New England Bunting Company.

ARTHUR G. POLLARD, Lowell, President Lowell Hosiery Company.

FREDERIC S. CLARK, Boston and North Billerica, Treasurer Talbot Mills.

HON. FREDERICK LAWTON, Lowell, Justice Superior Court.

THOMAS WALSH, Lowell, late Superintendent Hamilton Print Works.

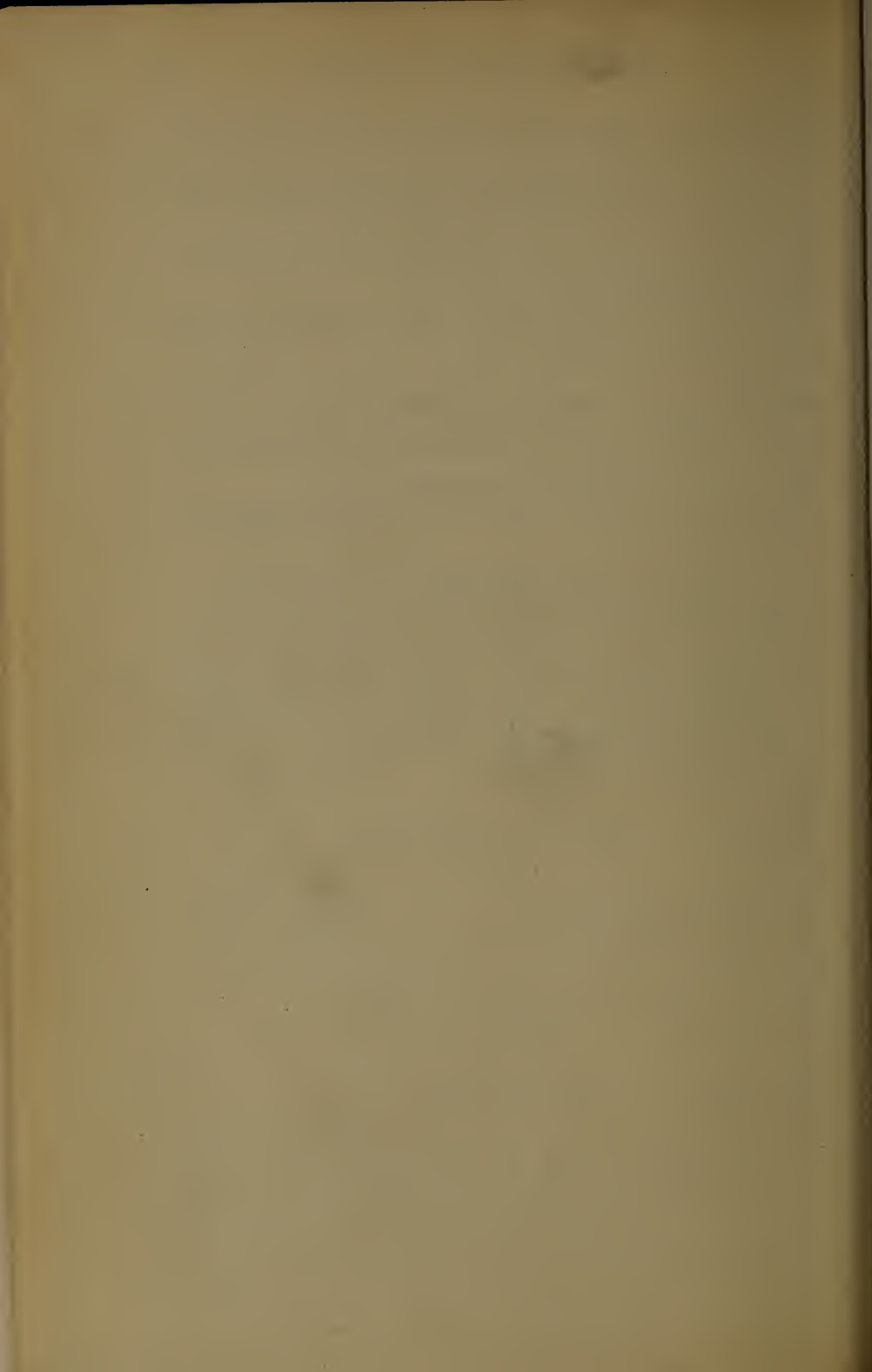
HAVEN C. PERHAM, Lowell, Treasurer Kitson Machine Shop and Lowell Machine Shop.

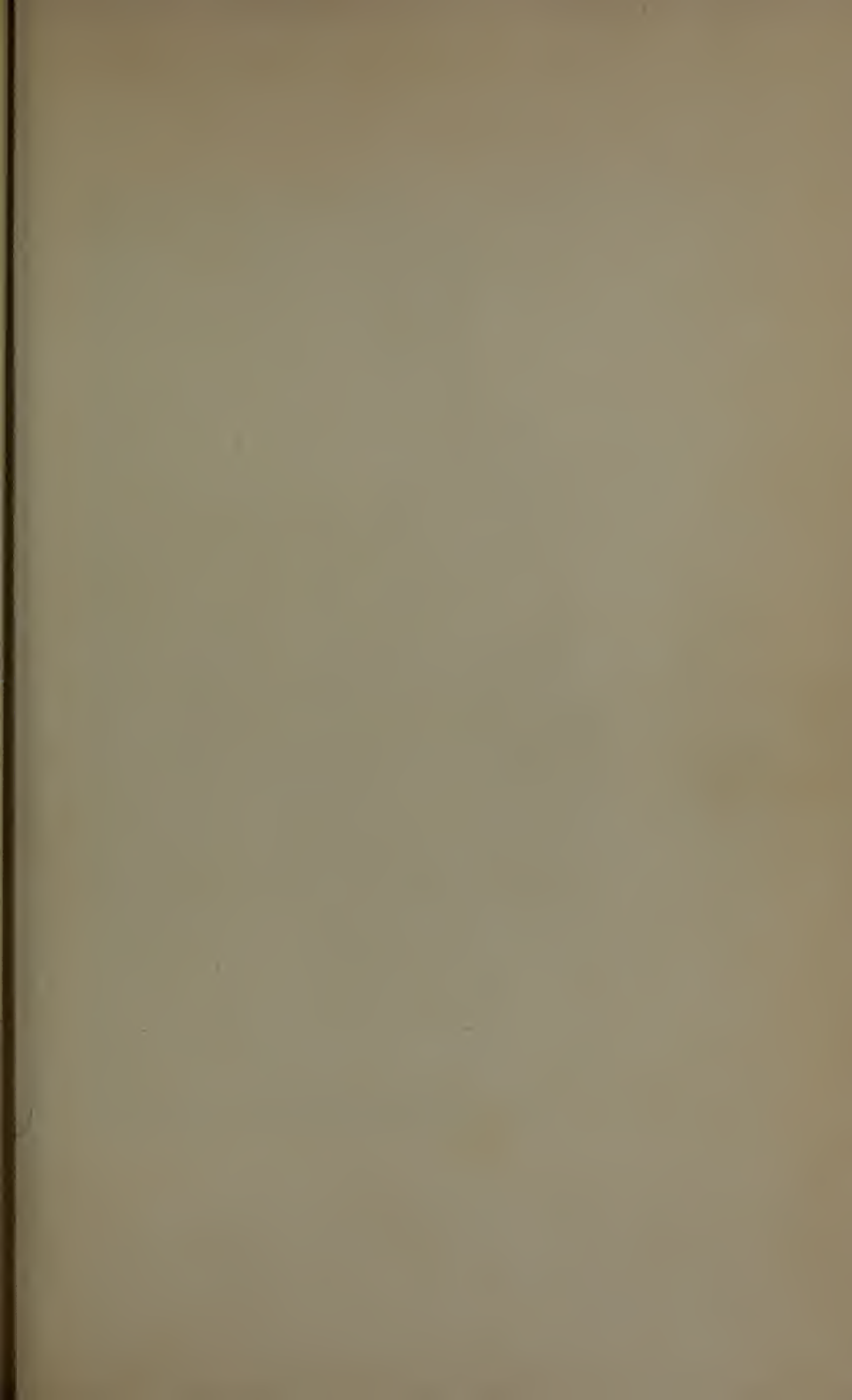
JAMES T. SMITH, Lowell, Attorney-at-Law.

- WALTER E. PARKER, Lawrence, Agent Pacific Mills, Boston corporation, mills at Lawrence.
- WILLIAM M. WOOD, Andover, President American Woolen Company, Boston office, mills at Lawrence, Blackstone, West Fitchburg, Fitchburg, Maynard, Lowell, Plymouth, Webster, Franklin, Uxbridge.
- GEORGE E. KUNHARDT, Lawrence and New York. Woolen Manufacturer.
- FRANK E. DUNBAR, Lowell, Attorney-at-Law, and President Appleton Company, Boston corporation, mills at Lowell.
- JOSEPH L. CHALIFOUX, Lowell, Merchant.
- FRANKLIN NOURSE, Lowell, Agent Lawrence Manufacturing Company, Boston corporation, mills at Lowell.
- CHARLES H. HUTCHINS, Worcester, President Crompton & Knowles Loom Works.
- FREDERICK A. FLATHER, Lowell, Treasurer Boott Mills. Boston corporation, mills at Lowell.
- HENRY A. BODWELL, Andover, Superintendent Smith & Dove Manufacturing Company, class of 1900.
- WILLIAM E. HALL, Lowell, Treasurer Shaw Stocking Company.
- WILLIAM R. MOORHOUSE, Boston, Color Chemist, Cassella Color Company, class of 1901.

Additional Trustees elected by Alumni under Act of 1905.

- For term ending June 30, 1910: ROYAL P. WHITE, class of 1904, Superintendent Stirling Mills, Lowell.
- For term ending June 30, 1913: RALPH F. CULVER, class of 1904, Superintendent Holliston Mills, Norwood, Mass.
- For term ending June 30, 1912: DEXTER STEVENS, class of 1904, Yarn Superintendent, Lancaster Mills. Boston corporation, mills at Clinton, Mass.
- For term ending June 30, 1911: T. ELLIS RAMSDELL, class of 1902, Agent Monument Mills, Housatonic, Mass.







FALMOUTH STREET BUILDING

SOUTHWICK HALL

BULLETIN

OF THE

Lowell Textile School

LOWELL, MASS.

Issued Quarterly

1910 - 1911

Entered August 26, 1902, at Lowell, Mass., as second class matter,
under Act of Congress of July 16, 1894.

Moody Street and Colonial Avenue



SOUTHWICK HALL

KITSON HALL AND CAMPUS

Trustees of the Lowell Textile School

(Incorporated 1895)

Honorary Trustee

FREDERICK FANNING AYER

New York City

The Corporation

Officers, 1910

A. G. CUMNOCK, PRESIDENT

JAMES T. SMITH, CLERK

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A. G. POLLARD, TREASURER

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Machine Shop

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FREDERICK A. FLATHER, Lowell, Treasurer Boott Mills

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WILLIAM E. HALL, Lowell, Treasurer Shaw Stocking Company

WILLIAM R. MOORHOUSE, Boston, Color Chemist, Cassella Color Com-
pany. Class of 1901.

CHARLES F. YOUNG, Lowell, Treasurer, Tremont & Suffolk Mills

Additional Trustees Elected by Alumni Under Act of 1905

For Four Years, from June 30, 1906.

ROYAL P. WHITE, Class of 1904, Superintendent Stirling Mills, Lowell, Mass.

For Four Years, from June 30, 1907.

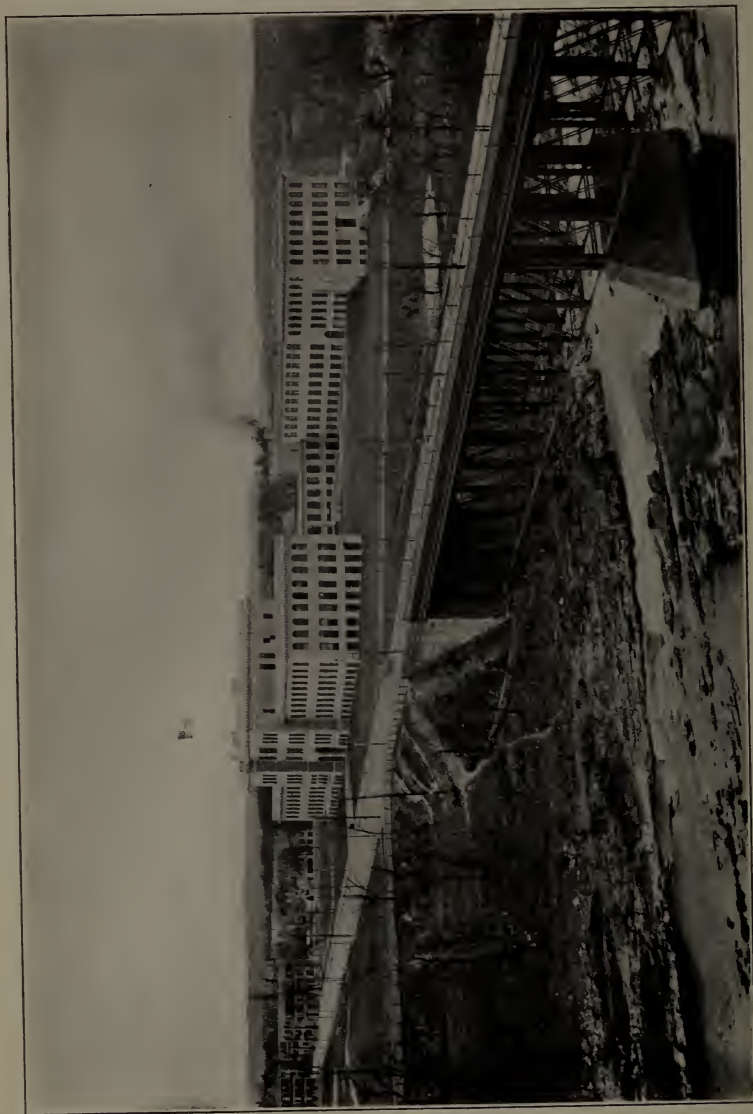
T. ELLIS RAMSDELL, Class of 1902, Agent Monument Mills, Housatonic,
Mass.

For Four Years, from June 30, 1908.

DEXTER STEVENS, Class of 1904, Yarn Superintendent, Lancaster Mills,
Clinton, Mass.

For Four Years, from June 30, 1909.

RALPH F. CULVER, Class of 1904, Superintendent Holliston Mills, Nor-
wood, Mass.



GENERAL VIEW OF SCHOOL, MERRIMACK RIVER

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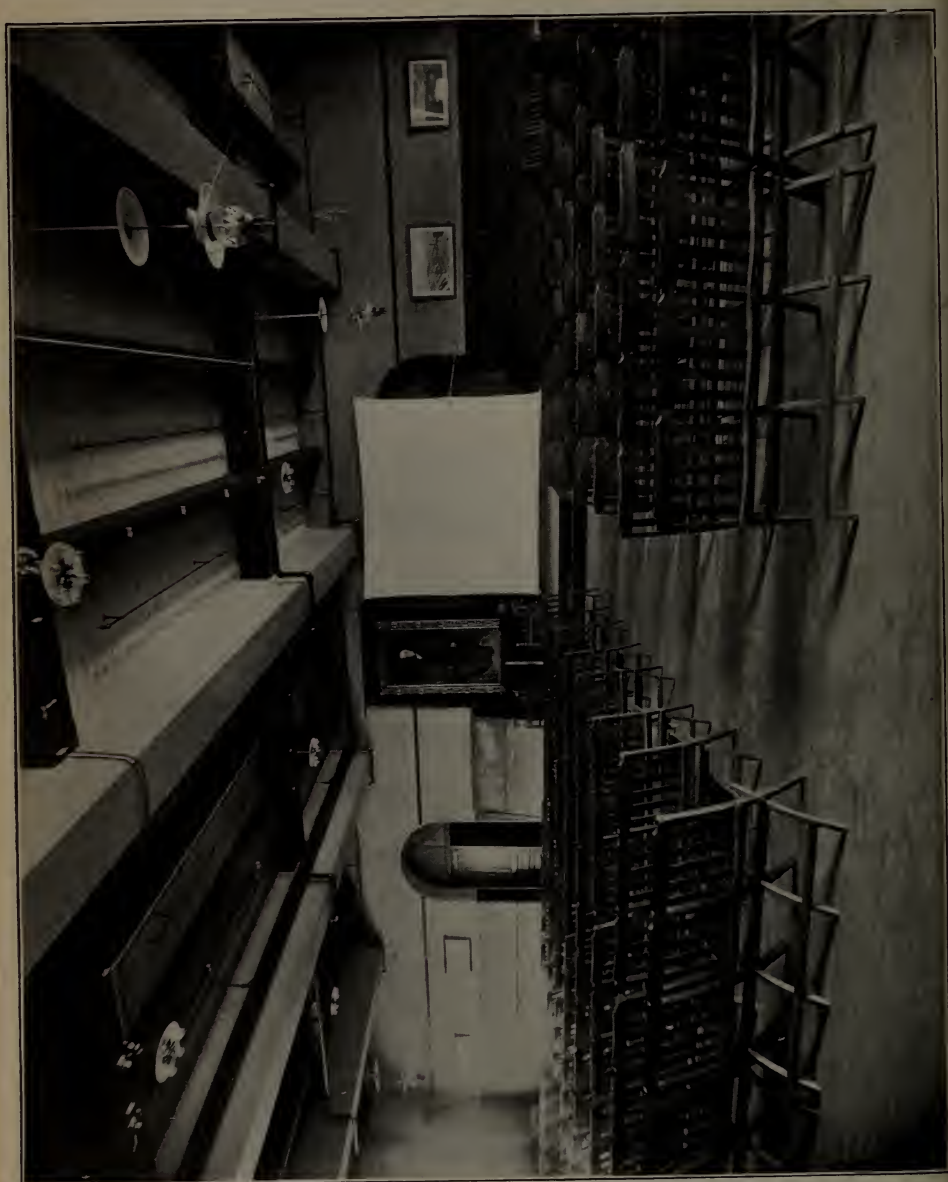
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STEPHEN E. SMITH,

In charge of Department of Cotton Yarns and
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Instructor in Power Weaving and Warp Preparation

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Instructor in Wool Sorting and Scouring

STEWART MACKAY,

Instructor in Hand Loom Weaving

ROBERT R. SLEEPER,

Instructor in Dyeing

HERBERT J. BALL, S. B.,

Instructor in Mechanical Engineering

HENRY H. CROMPTON,

Instructor in Worsted Yarns



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MILES R. MOFFATT, S. B.,	Instructor in Chemistry
HOWARD D. SMITH, PH. D.,	Instructor in Chemistry
ALBERT E. MUSARD,	Instructor in Jacquard Weaving
EUGENE C. WOODCOCK,	Instructor in Woolen Yarns
GEORGE A. CUSHMAN, A. M., *	Instructor in Chemistry
HERBERT C. WOOD,	Instructor in Cotton Yarns
GEORGE W. HATHORN,	Instructor in Dyeing
WALTER E. HADLEY,	Instructor in Chemistry
JOHN CLEMENT, A. B.,	Instructor in Commercial Languages, English and History
FELIX D. LANGEVIN,	Instructor in Machine Shop Practice
HENRY K. DICK,	Instructor in Knitting
STARR H. FISKE,	Assistant Instructor in Weaving
CHARLES R. CHURCH,	Instructor in Physical Culture
ARCHIBALD R. GARDNER, M. D.,	Medical Adviser

Faculty

CHARLES H. EAMES

FENWICK UMPLEBY
LOUIS A. OLNEY
EDGAR H. BARKER

GEORGE H. PERKINS
STEPHEN E. SMITH
ARTHUR A. STEWART

1911

JULY						
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SEPTEMBER						
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OCTOBER						
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NOVEMBER						
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DECEMBER						
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JANUARY						
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FEBRUARY						
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MARCH						
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MAY						
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JUNE						
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CALENDAR

1910

Semi-annual examinations begin Tuesday, January 18.
Second term begins Monday, January 31.
End of first five-week period of second term, March 5.
End of second five-week period of second term, April 9.
Annual examinations begin Tuesday, May 17.
Certificates awarded to Evening Graduates, May 4.
Diplomas awarded to Day Graduates, Friday, June 3.
First entrance examinations, June 20 and 21, at 9 a. m.
Fall entrance examinations, September 12 and 13, at 9 a. m.
Re-examinations and examinations for advanced standing, commence Friday, September 16, at 9 a. m.
Entrance examinations for evening students, Thursdays, commencing September 29, at 7 p. m., continuing until opening of classes.
Day school year begins Tuesday, September 27.
Evening school year begins Monday, October 17.
End of first five-week period of first term, October 29.
Thanksgiving recess, Wednesday, November 23 to Saturday, November 26, inclusive.
End of second five-week period of first term, December 3.
Christmas recess, Friday, Dec. 23, to Monday, Jan. 2, 1911, inclusive.

1911

Semi-annual examinations begin Tuesday, January 17.
Second term begins Monday, January 30.
End of first five-week period of second term, March 4.
End of second five-week period of second term, April 8.
Annual examinations begin Tuesday, May 16.
Certificates awarded to Evening Graduates, May 3.
Diplomas awarded to Day Graduates, Friday, June 2.
Entrance examinations, June 19 and 20, at 9 a. m.
There will be no sessions of the school on Washington's birthday or on Patriots' Day.



COTTON A SON DESA REFINA

The Lowell Textile School

The Lowell Textile School was established, and is managed, by the Trustees of the Lowell Textile School of Lowell, Massachusetts, "for the purpose of instruction in the theory and practical art of textile and kindred branches of industry," as set forth in the act of incorporation.

The movement for the establishment of the School dates from June 1, 1891, but it was not opened for instruction until February 1, 1897.

Not only did the normal progress of the textile industry require such a school, but through the rapid development of the manufacture of the coarser cotton fabrics in the southern states, a crisis had arrived in the leading industry of New England which could only be met by wider and more thorough application of the sciences and arts for the production of finer and more varied fabrics.

Modeled on the lines of the departments of the higher Polytechnic Institutes, it offers thorough instruction in the elements and principles of the sciences and arts applicable to textile and kindred branches of industry and also in their application to the manufacturing of all varieties of textile fabrics, and the machinery required therefor.

In industrial education the distinction between Trade and Technical Industrial Schools is coming to be understood. The Lowell School belongs to the latter class. Beginning with limited equipment, instruction staff, and means, instruction at first was by Mill or Trade school methods—the pupil was brought directly to the machine, its parts explained to him, and its operation in manufacturing. The curriculum was, however, rapidly extended, as contemplated in the original plan, department after department opened and equipped, and commodious and well adapted buildings provided for a permanent home.



While the progress of invention and the demands of ever changing markets will compel constant improvement in methods and additions to the very extensive equipment, the period of establishment is substantially closed. All departments are open for instruction in all branches of the textile art under an extensive and able corps of instructors and assistant instructors.

Of the incorporators the permanent trustees (limited to twenty) are mainly representatives, as president, treasurer, agent, or superintendent, of the management of great textile or textile machine corporations of the Commonwealth, and associated with them are, ex-officiis, His Honor, the Lieutenant Governor and the Commissioner of the State Board of Education, and two trustees appointed for four-year terms by the Governor and Council. Also the Mayor, Superintendent of Schools, the presiding officers of the two branches of the City Council, and a representative of the textile council of the city of Lowell. At the session of 1905 the Legislature authorized the graduates of the school to elect two additional trustees, and by an act of 1906 the number was increased to four for four-year terms, one being elected each year.

By the terms of the by-laws at least three-fourths of the permanent trustees must be persons "actually engaged in or connected with textile or kindred manufactures."

Lowell, Massachusetts, is called the "Mother Textile City of America," and in locating the school at this center a considerable advantage is secured for the reason that every commercial fibre is utilized in the products of the great Merrimack Valley Textile district. The practical work of the school is therefore kept closely in touch with the several branches of the industry which are included in the courses of study.

His Excellency, Governor Roger Wolcott, formally opened the school on January 30, 1897, there being present a large and representative gathering of gentlemen from the textile industries in all portions of New England. The regular classes of the school were opened on February 1, 1897, and have been regularly conducted since that time.

His Excellency, Governor John L. Bates, dedicated the buildings forming the permanent home of the school on February 12,

COTTON COMBING



1903, in the presence of a large number of guests representing the Legislature as well as the educational, textile, and commercial interests of the Commonwealth.

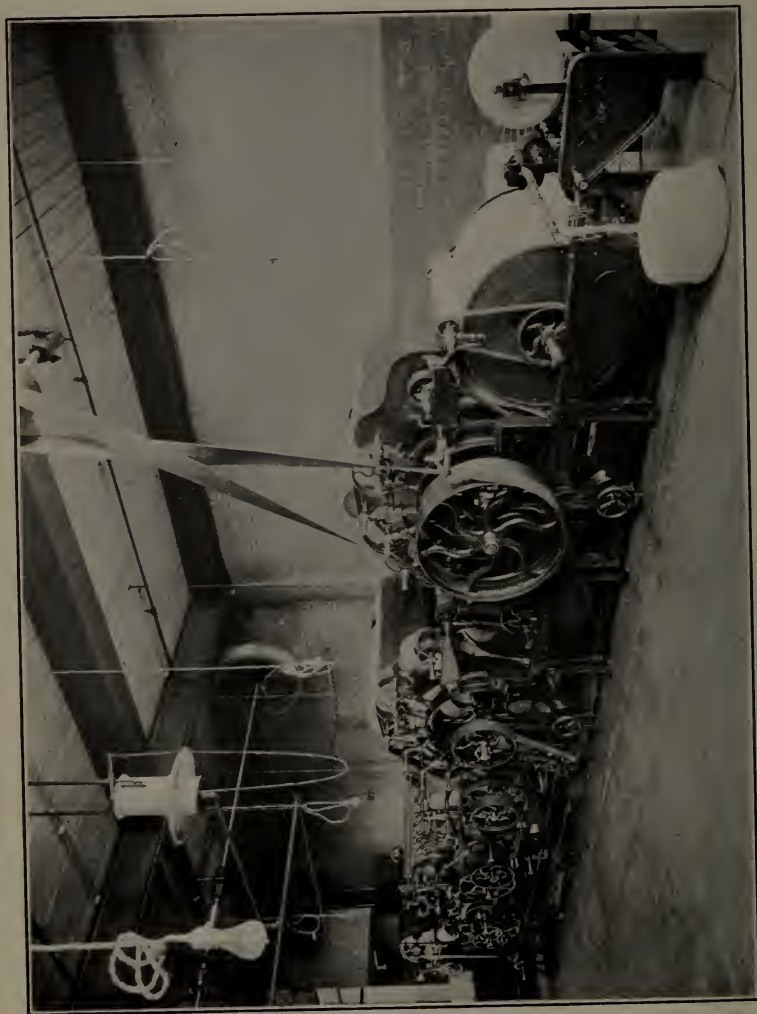
Experience has demonstrated that applicants for day instruction should enter more thoroughly prepared, and it now seems advisable that all such students should have had preparatory training, the equivalent of that afforded by the regular four-year course of a standard high school. Even in such cases it is necessary to include in the curriculum of this school primary instruction in branches of General Chemistry, Decorative Art, Mechanics and Mechanical Drawing. These subjects must be taught in a most thorough manner, for upon these depend the value and standing of the graduate in the great textile industries. Evening pupils must have had the equivalent of a grammar school course. While one may acquire at the school thorough knowledge of the principles of the sciences applicable in widely diverse lines of industry, the principles of science and art are taught with the particular view to their application to textile problems and processes. For graduates of universities and scientific institutions, special applied textile courses are offered to those who have had the proper preparatory training.

The mechanical equipment of the school includes the best makes of textile machinery, and these machines, while built as they would be for regular work, are, so far as possible, adapted to the experimental work which is of particular value in such an institution as this.

There is a more varied equipment in this school than in any other, either in America or Europe, and it is now possible to convert the raw stock into the finished fabric, within the school.

The growth of the school has been constant, as is evident from the fact that when it was opened February 1, 1897, there were 32 day and 110 evening pupils. January 1, 1910, the roster showed 184 day pupils and 589 evening pupils or 773 in all. The annual per cent of increase for the preceding years is fourteen per cent.

On January 1, 1903, the School was transferred from the rented quarters that it had occupied for five years to the site and buildings where it is permanently located.



WORSTED CARD

The site is a commanding one, consisting of about eighteen acres at a high elevation, on the west bank of the Merrimack River, extending to and overlooking the rapids of Pawtucket Falls, the first to be utilized for power weaving in America on an extensive scale. The site was contributed by Frederick Fanning Ayer, Esq., of New York City, and the Proprietors of the Locks and Canals on the Merrimack River. To this site has been added three acres through the continued liberality of Mr. Ayer. The buildings consist of Southwick Hall, Kitson Hall, and the Falmouth Street Building and present plans contemplate additions during 1910 and 1911.

Southwick Hall includes a central mass 90 x 90 ft., having three stories and two wings 80 x 85 ft. with two stories and a well lighted basement. The building is pierced in the center by an arched way from which access is had to the wings and to the central courtyard. The northern wing is occupied by the General Offices, Engineering, Decorative Art and Finishing Departments, while the southern wing is entirely occupied by the Chemistry and Dyeing Departments. In the basement is located an Industrial Chemistry Laboratory for the manufacture of dyes from the crude material.

Kitson Hall makes a right angle with Southwick Hall and is 60 x 252 ft. with one story and a basement. It is occupied by the Cotton Yarn Department and heating, lighting, ventilating and power plant. The capacity of Kitson Hall was recently doubled permitting of an extension of the Finishing Department, a Mechanical Engineering Laboratory, a Machine Shop, Evening Drawing Room, Students' Athletic Rooms, Store Rooms, etc.

Falmouth Street buildings form the third side of the quadrangle and consists of two portions, one 75x130 ft., three stories, and the head house 70 x 80 ft., three stories and basement. This building is occupied by the Departments of Weaving and Wool Yarns. The head house is occupied by these departments, and contains equipment for French Spinning, Warp Preparation, Wool Scouring, Carbonizing and Conditioning. The upper floor contains the Textile Design Department.



WOOLEN AND WORSTED YARN DEPARTMENT

The buildings are all faced with light brick with granite and Indiana lime stone trimmings and are of modern mill construction adapted to educational uses. The floor space of the School is quadrupled in the new home, permitting of a very large increase in equipment and is now occupied by the several departments as follows:

Cotton Yarns and Knitting	12,000 sq. ft.
Woolen and Worsted Yarns	20,960 " "
Decorative Art and Textile Design	16,806 " "
General Chemistry and Dyeing Laboratories	20,000 " "
Finishing	5,806 " "
Power Weaving	15,360 " "
Mechanical and Electrical Engineering	15,729 " "
Physical Culture	7,200 " "

The additional floor space is devoted to Administration Offices, Library, Assembly Halls, Class Rooms, Store Rooms, Power, Heating and Ventilating Plant, etc.

Southwick Hall was contributed by the Commonwealth of Massachusetts and Frederick Fanning Ayer, Esquire, of New York City, and is a memorial to Royal Southwick, a leading textile manufacturer, a public man of earlier days, and a maternal ancestor of Mr. Ayer.

Kitson Hall, dedicated to the memory of Richard Kitson, was contributed by Charlotte P. Kitson and Emma K. Stott, his daughters; the Kitson Machine Company of Lowell, founded by Mr. Kitson, was also a generous contributor.

Though from the first the management has kept in view the clearly defined objective which called for the establishment of the school, namely, the needs of the textile and kindred industries, it has developed its curriculum, its instruction methods, and equipment as those needs arose or became evident. At this writing its chemical and dyeing, decorative art, design, yarn and weaving departments are liberally housed, equipped, and provided with able instructors for the highest efficiency, though additional floor space is required and is being provided as the roster of pupils increases. The demand for a very large addition to the mechanism, machine shop, and power production and application



branches embraced by the title "Textile Engineering" was supplied in 1908. Last year a large addition of floor space was made to the Design Department and this year the Woolen and Worsted, Chemistry and Dyeing Laboratories, it is expected, will also be largely extended.

DAY CLASSES

These are especially intended for the instruction of those who contemplate entering the business of textile manufacturing in any branch. The courses are sufficiently complete to enable one to start without any previous acquaintance with textiles; but at the same time those who have been engaged in such business and wish to improve their knowledge and experience, can with profit pursue a course of study at the school.

Each course covers a period of three years, at the satisfactory completion of which the regular diploma of the school is awarded. It is very probable that within the coming two or three years a four year course will be offered in some of the departments. At the completion of such course a proper degree will be granted.

There is one term of preliminary instruction, which is common to all courses. At the end of this term, each student is required to select the course he is to follow in his subsequent studies, and the instruction given from this point is specialized to suit each course.

The five regular diploma courses are:

- I. Cotton Manufacturing.
- II. Wool Manufacturing.
- III. Textile Designing.
- IV. Chemistry and Dyeing.
- VI. Textile Engineering.

EVENING CLASSES

It is intended to give evening instruction to those who are engaged during the day in mills and work shops, to enable them to perfect their knowledge of the branches in which they work, to acquire knowledge of other processes than those in which they



WOOLEN YARN DEPARTMENT

are regularly engaged, and to pursue in the course of several winters, a thorough technical education without interfering with their daily duties.

The courses offered are similar to those of the day; but less time is devoted to the machine or laboratory work, since in most cases this is of small moment. Ordinarily the handling of the machinery is a part familiar to most of the students through contact with it in the day time, and in such cases the explanations and calculations are of the greater importance. In some cases it is possible to pursue two courses together, but this depends always on the arrangement of the schedule for any particular year.

All Evening Courses are free to residents of Lowell. All applicants must present satisfactory credentials showing that they are graduates of a Grammar School or school of higher standing, or they must pass entrance examinations in Arithmetic and English. For the latter subject a short composition must be written on a given theme, and a certain amount must be written from dictation. In arithmetic the applicant must show suitable proficiency in addition, subtraction, multiplication, division, common and decimal fractions, percentage, ratio and proportion.

Courses are offered in:

- I. Cotton Spinning—2 years.
- II. (a) Woolen Spinning—2 years.
(b) Worsted Spinning—3 years.
- III. Textile Designing—3 years.
- IV. Chemistry and Dyeing.
 - (a) Elementary Chemistry—2 years.
General Chemistry including Inorganic and Organic
Qualitative Analysis.
 - (b) Textile Chemistry and Dyeing—3 years.
Lectures in Textile Chemistry and Dyeing.
Laboratory Work in Dyeing.
 - (c) Analytical Chemistry—3 years.
Laboratory Work and Lectures in Quantitative
Analysis.
 - (d) Textile and Analytical Chemistry—4 years.
Lectures in Textile Chemistry and Dyeing.
Laboratory Work in Analytical Chemistry.



WOOL SCOURING AND CARBONIZING

In order to take Course (b), (c) or (d), candidates must have certificate from Course (a), or show by examination or approved credentials that they have taken the equivalent work covered by this course.

- V. (a) Cotton Weaving—1 year.
- (b) Woolen and Worsted Weaving—1 year.
- (c) Dobby and Jacquard Weaving—1 year.

VI. Mechanics and Electricity—3 years.

Mechanical Drawing—3 years.

Architectural Drawing—3 years.

Freehand Drawing—3 years.

Machine Shop—3 years.

VII. Woolen and Worsted Finishing—1 year.

List of subjects embraced in each course is similar to that of the day and may be found beginning on page 100.

For the satisfactory completion of any of the above numbered courses, the certificate of the school will be awarded; providing, however, that the student has been in attendance in the course and during the year for which the certificate is granted; the diploma of the school will be awarded in exchange for certificate of satisfactory completion of those subjects which go to make up any one of the regular diploma courses.

No diploma or certificate will be awarded until all dues to the school have been discharged.

Fee for each course for all except residents of Lowell, is \$5.00 per year payable in advance. All students, whether from Lowell or not, taking first or second year Chemistry and Dyeing Course, are required to make a deposit of \$5.00 at the commencement of the course. A deposit of \$10.00 will be required of all third and fourth year students taking this course. This is to cover the cost of laboratory breakages, and at the end of the year any unexpended balance is returned or an extra charge made for the excess breakage.

The schedule showing the arrangements of classes for each term will be announced at the opening of each term.



FRENCH SPINNING DEPARTMENT

WOMEN'S DEPARTMENT

Among the many fields in which woman has entered, none has been found in which her natural refinement of taste and skill can be used to better advantage than in designing; but natural ability, though the prime requisite, is by no means all, for a certain amount of technical knowledge must be gained to achieve success. This department combines decorative art and textile design, and regular attendance is required as in other departments.

EQUIPMENT

The equipment of machinery, inventoried January 1, 1910, at \$219,080.62, is the most varied for textile educational purposes, and is being constantly augmented. The builders of the various machines installed keep in close touch with the school, adding to the machines such improvements as are made from time to time. This operates to mutual advantage of student and manufacturer.

COTTON DEPARTMENT

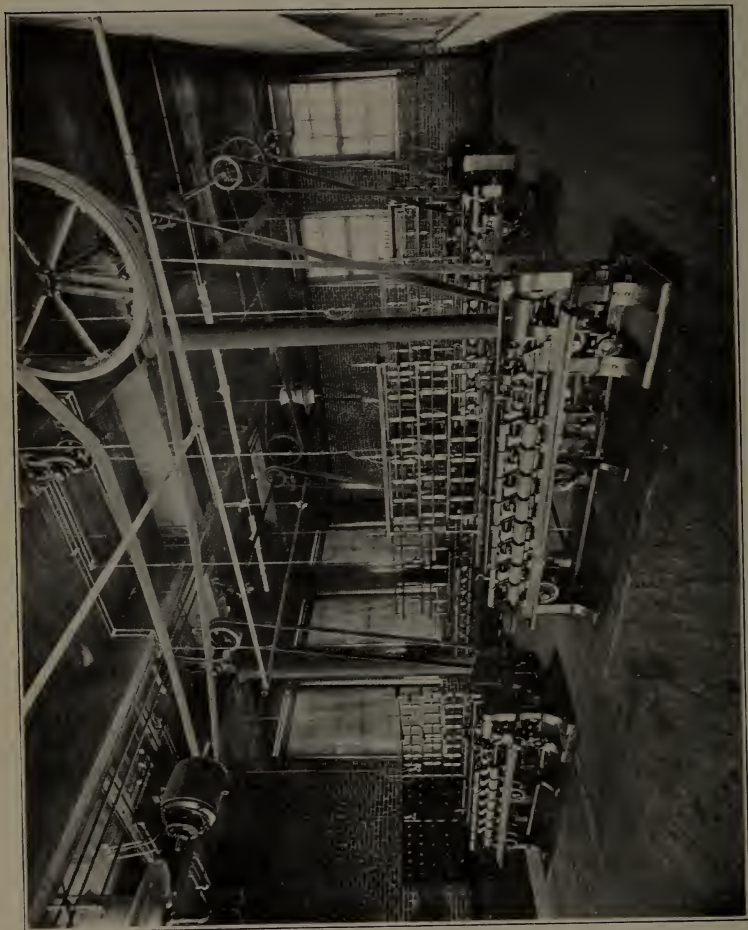
Ginning

- One 50 saw gin made by Daniel Pratt Gin Co., Prattsville, Ala.
- One Prior Roller Gin.

Opening, Picking and Waste Machinery

An outfit of Kitson Picking Machinery from works of Kitson Machine Co., Lowell, Mass., including:

- One No. 7 Opener with Automatic Feeder connected by Perham patent Cleaning Trunk to
- One 40 in. Single Beater Breaker Lapper with Condenser and gauge box feed.
- One 40 in. Single Beater Intermediate Finisher Lapper with Perham & Davis Sectional Plate Evener, apron to double four laps.
- One 40 in. Single Beater Finisher Lapper with Perham & Davis Sectional Plate Evener, apron to double four laps, Kirschner Patent Carding Beater.
- One Roving Waste Opener.
- One Thread Extractor.



FRENCH SPINNING DEPARTMENT

Carding, Combing and Drawing

The following machinery made by the Lowell Machine Shop, Lowell, Mass.

One Top Flat Card.

Three Revolving Flat Cards.

Two Railway Heads.

Two Drawing Frames.

One of these cards is equipped with the Chapman Electric Neutralizer, made by The Chapman Electric Neutralizer Co., Portland, Me.

From Kitson Machine Company

Stripping Rolls, etc.

From the Whitin Machine Works, Whitinsville, Mass.

One 40 in. Revolving Flat Card.

Card Grinding Rolls.

One Ribbon Lapper.

One Six Head Comber.

From the Mason Machine Works, Taunton, Mass.

One Sliver Lap Machine.

One Comb.

Roving, Spinning and Twisting

From Lowell Machine Shop, Lowell, Mass.

One Slubber.

One Intermediate.

One Fine Frame.

One Jack Frame.

Three Ring Spinning Frames.

One Spinning Mule.

One Spooler.

One Wet and Dry Twister.

From Draper Company, Hopedale, Mass.

One Wet and Dry Twister.

From Whitin Machine Works, Whitinsville, Mass.

Two Ring Spinning Frames.

From Woonsocket Machine and Press Co., Woonsocket, R. I.

One Intermediate Fly Frame.

From Asa Lees Co., Oldham, Wm. Firth Company, Agents.

One Mule for fine spinning.

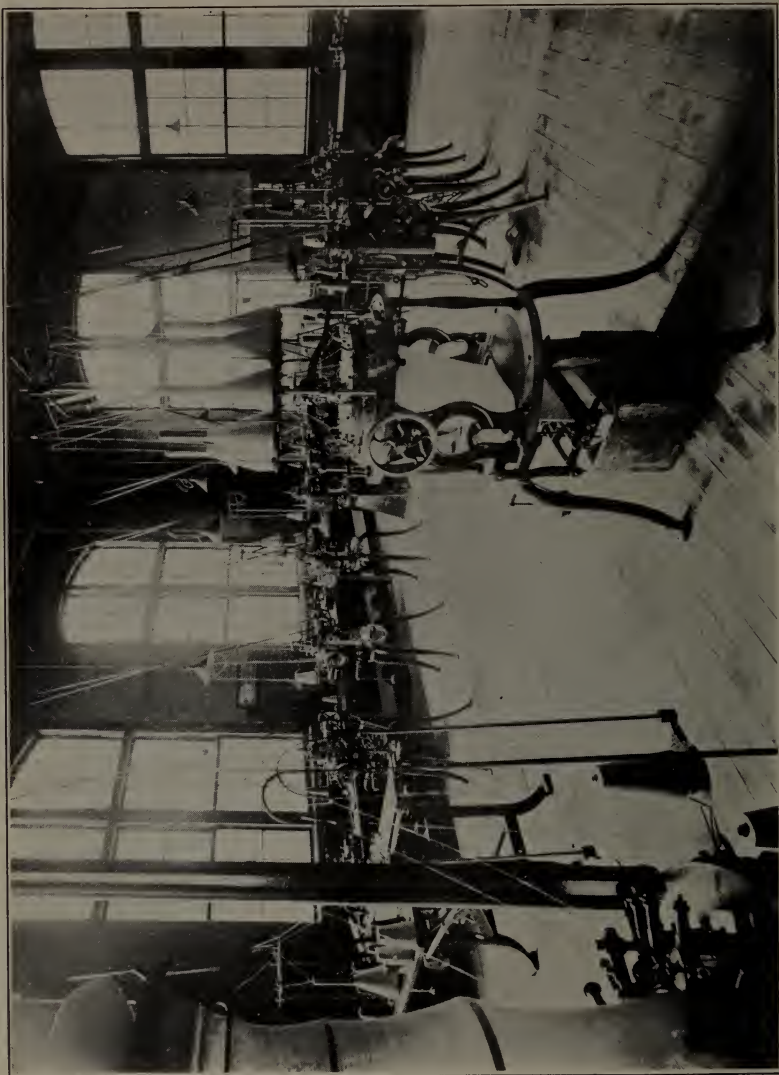
Miscellaneous Machinery of this Department includes:

From the Lowell Machine Shop, Lowell, Mass.

One Reel.

One Model Fine Fly Frame.

One Model Fly Frame Compound.



KNITTING DEPARTMENT

- One Model Card Feed.
- One Model Flat Grinding Device.
- One Model Scroll Setting Device.

From The Universal Winding Company.

- One Six head Universal Winder, for cones, tubes or multiple winding.

From George W. Payne Co., Pawtucket, R. I.

- One 12 Spindle Cone Winder.

From Draper Company, Hopedale, Mass.

- One Weeks Banding Machine.
- One Moscrop Single Thread Testing Machine.

Miscellaneous Machines.

- One Yarn Inspection Machine with black boards.
- One Barbour Knotter.
- Two Yarn Reels and Grain Scales.
- One Power Yarn Tester.
- One Twist Counter.

From Howard Brothers, Worcester, Mass.

- One Exhibition Board of Hand Cards.
- One Exhibition Board of Card Clothing.

Knitting Department

- One Mayo "Acme" Full Automatic Seamless Knitting Machine from Mayo Knitting Machine and Needle Co., Franklin Falls, N. H.
- One Mayo "Acme" Full Automatic Knitting Machine with lace front attachment from Mayo Knitting Machine and Needle Company, Franklin, N. H.
- One Geo. D. Mayo Full Automatic Seamless Knitting Machine from Geo. D. Mayo Machine Co., Laconia, N. H.
- One George D. Mayo Full Automatic Knitting Machine with yarn changer and striper from Geo. D. Mayo Machine Co., Laconia, N. H.
- One Brinton Full Automatic Seamless Knitting Machine from H. Brinton Company, Philadelphia, Pa.
- One Brinton 200 Needle Ribber with clearing course attachment from H. Brinton Company, Philadelphia, Pa.
- One Brinton Rib Knitting Machine with Knee and Ankle Splicer and Plater from H. Brinton Co., Philadelphia, Pa.
- One McMichael and Wildman Rib Top Knitting Machine from Wildman Mfg. Company, Norristown, Pa.



DESIGN LECTURE ROOM

- One Wildman Rib Knitting Machine, with Knee and Ankle Splicer and Automatic Stop Motion, Wildman Mfg. Co., Norristown, Pa.
- One Wildman Rib Top Machine with Automatic Stop Motion from Wildman Mfg. Company, Norristown, Pa.
- One Branson Stocking Machine from Branson Knitting Machine Co., Philadelphia, Pa.
- One Banner Knitting Machine with splicing and plating attachments from the Hemphill Mfg. Co., Pawtucket, R. I.
- One Scott & Williams New Automatic Half Hose from Scott & Williams, Philadelphia, Pa.
- One Scott & Williams Ribbed Underwear Machine.
- One Crane 19 in. cylinder Flat Web Machine from Crane Mfg. Co., Lakeport, N. H.
- One Grosser, One Section Jacquard Machine from Grosser Knitting Machine Company, N. Y.
- One Grosser two thread looper for fine work from Grosser Knitting Machine Company, New York.
- One Lamb Sweater Machine from Lamb Knitting Machine Company, Chicopee Falls, Mass.
- One Lamb Glove Machine from Lamb Knitting Machine Company, Chicopee Falls, Mass.
- One 24 inch Lamb Sweater Machine from Lamb Knitting Machine Company, Chicopee Falls, Mass.
- One Beattie Looper from Beattie Machine Works, Cohoes, N. Y.
- One Hepworth Looper with Trimming Attachment from J. W. Hepworth and Co., Philadelphia, Pa.
- Five Sewing Machines, including two Shell Stitch Machines and three 2 and 3-thread Overseaming and Crocheting Machines, from Merrow Machine Co., Hartford, Conn.
- Five Sewing Machines, including machines for Overseaming, Double Stitch Covering, Seaming and Welting, Vest Finishing, etc., from Union Special Sewing Machine Co., Boston Mass.

WOOLEN AND WORSTED DEPARTMENT

Wool Sorting and Grading

This department is thoroughly equipped with benches, baskets, etc., for sorting wool in a convenient manner, and in addition there are samples of all grades and types of wool and other fibres.

Scouring and Carbonizing

- Wool Scouring Machinery, C. G. Sargent's Sons Corp., Graniteville, Mass., consisting of
- Cone Duster for Grease Wool.
- Two Scouring Bowls, each 17 ft. x 24 in., with Parallel Rakes.



POWER WEAVING

One Automatic Feeder for Scouring Bowls.
 One Automatic Feeder for Dryer.
 One Single Apron Dryer.
 Carbonizing Screw Acid Tank.
 Carbonizing Duster, with Crush Rolls.
 From North Chelmsford Machine Co.
 One Rinse Box.
 From Schaum & Uhlinger.
 One Hydro Extractor.
 From C. S. Dodge, Lowell, Mass.
 One Shoddy Picker.
 One Bagging Stand.

Woolen

Picking

One Parkhurst Burr Picker, Atlas Mfg. Co., Newark, N. J.
 One Mixing Picker, Davis & Furber Machine Co., North Andover, Mass., equipped with Improved Mixing Picker Feed, and Spencer Oiler, both made by George S. Harwood & Son, Boston, Mass.

Carding

One set of Woolen Cards, including :

First Breaker, Second Breaker and Finisher, Davis & Furber Machine Co., North Andover, Mass.; this set of cards equipped with Bramwell First Breaker Feed, George S. Harwood & Son., Boston, Mass.; Torrance Balling Head and Creel, (Torrance Mfg. Co., Harrison, N. J.) between First Breaker and Second Breaker; Apperly Feed, (George S. Harwood & Son, Boston, Mass.) between Second Breaker and Finisher, and Combination Rub Rolls and Apron Condenser, (Davis & Furber Machine Co., North Andover, Mass.), on Finisher. These cards are for medium or coarse work.

One set of Davis & Furber Woolen Cards including :

First Breaker, Second Breaker and Finisher. This set of cards equipped with Bramwell First Breaker Feed, (George S. Harwood & Son, Boston, Mass.); Apperly Feed with Kemp Traveller, (George S. Harwood & Son, Boston, Mass.), between First Breaker and Second Breaker; Bates Feed, (E. V. Bates, Lowell, Mass.), between second Breaker and Finisher, and Davis & Furber Double Apron Condenser, on Finisher. These cards are for fine work.

Both sets of cards are equipped with Chapman Electric Neutralizer, made by Chapman Electric Neutralizer Co., Portland, Me.

One Sample Mixing Card, Torrance Mfg. Co., Harrison, N. J.



POWER WEAVING

JACQUARD SECTION

Spinning

- One Spinning Mule, 120 spindles, Davis & Furber Machine Co., North Andover, Mass.; Bobbin Holders, supplied by American Bobbin Holder Co., W. Medway, Mass.
- One Spinning Mule, 120 spindles, Johnson & Bassett, Worcester, Mass.; Bobbin Holders supplied by Murdock & Geb, Franklin, Mass.
- One 1907 Fancy Yarn Twister, 20 spindles, Davis & Furber Machine Co., North Andover, Mass.

Card Grinding

- One Roy Grinding Frame, B. S. Roy & Son, Worcester, Mass.
- Two Roy Traverse Grinders, B. S. Roy & Son, Worcester, Mass.
- One Entwistle Traverse Grinder, T. C. Entwistle Co., Lowell, Mass.
- One Complete set of Carders' Tools, W. H. Brown, Worcester, Mass.

Worsted

Carding

- One 50-inch Double-cylinder Worsted Card (4 lickerin), Davis & Furber Machine Co., North Andover, Mass., equipped with Bramwell Feed, George S. Harwood & Son, Boston, Mass. Also equipped with a Chapman Electric Neutralizer, Chapman Electric Neutralizer Co., Portland, Me.

Backwashing

- One Double Bowl, Five Cylinder Backwasher, with Gill Box, Taylor-Wadworth & Co., Leeds, Eng., equipped with blueing motion, oiling motion, and Layland Patent pressure motion.

Gilling

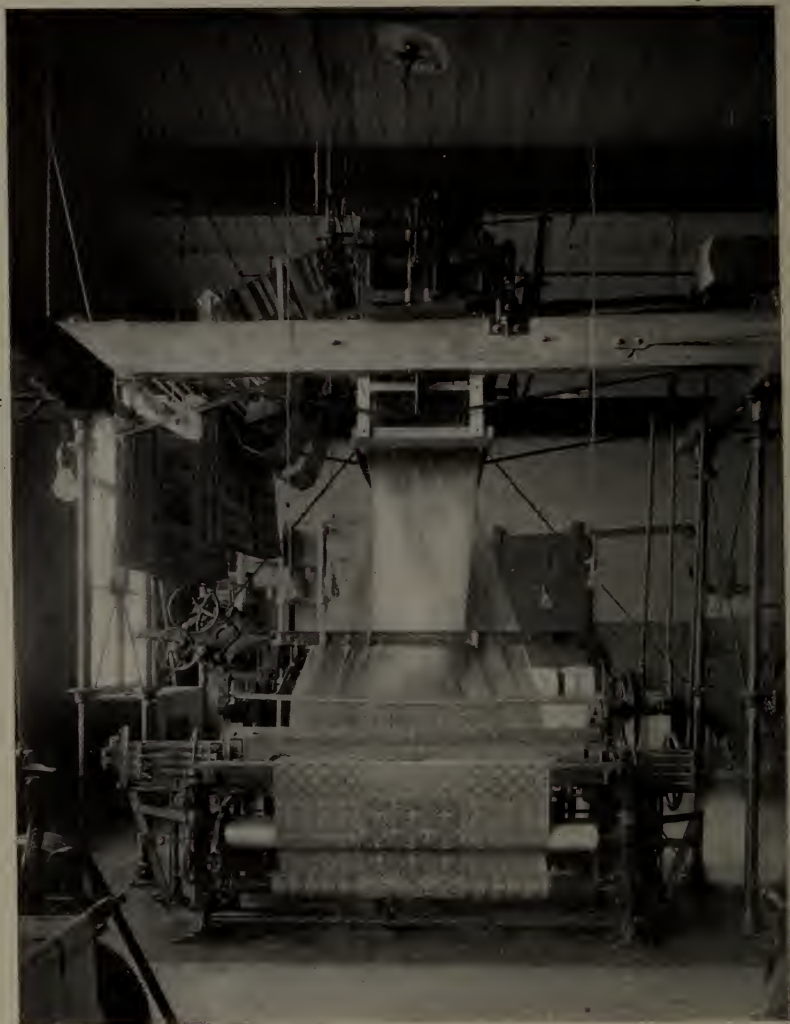
- One Doubling Balling Head Gill Box (with double screws), Lowell Machine Shop, Lowell, Mass.
- One Weigh Gill Box and Creel, Lowell Machine Shop, Lowell, Mass.

Combing

- One Baller, (punch), Crompton & Knowles, Worcester, Mass.
- One Noble Worsted Comb, Crompton & Knowles, Worcester, Mass.

Gilling

- One Finishing Can Gill Box, Hall & Stell, Keighley, England.
- One Finishing Balling Head Gill Box, Hall & Stell, Keighley, England.



A TAPESTRY LOOM

Bradford System of Drawing, Spinning and Twisting

The following Drawing, Spinning and Twisting Machinery, from Prince Smith & Son, Keighley, England.

One Revolving Creel for 12 Balls.	One Double Head Can Gill Box.
One 2 Spindle Drawing Box.	One 2 Spindle Gill Box.
One 2 Spindle Weigh Box.	One 12 Spindle Flyer Spinner.
One 4 Spindle First Finisher.	One 12 Spindle Ring Spinner.
One 12 Spindle Dandy Reducer.	One 12 Spindle 2 Fold Cap Twister.
One 12 Spindle Cap Spinner.	One 12 Spindle 6 Fold Ring Twister.

The following Drawing, Spinning and Twisting Machinery from the Lowell Machine Shop, Lowell, Mass.:

One 2 Spindle Drawing Box.	One 8 Spindle Cone Rover.
One 6 Spindle Second Finisher.	One 48 Spindle Cap Spinner, 4 ft. end
One 24 Spindle Dandy Rover.	One 48 Spindle Cap Spinner, 5 ft. end
One 6 Spindle Cone Reducer.	One 48 Spindle Boyd Ring Twister.

One Six Gang Universal Winder, equipped for cones or straight tubes, Universal Winding Co., Boston. Mass.

One Tape Band Sewing Machine, The Singer Mfg. Co., New York.

French System of Drawing and Spinning

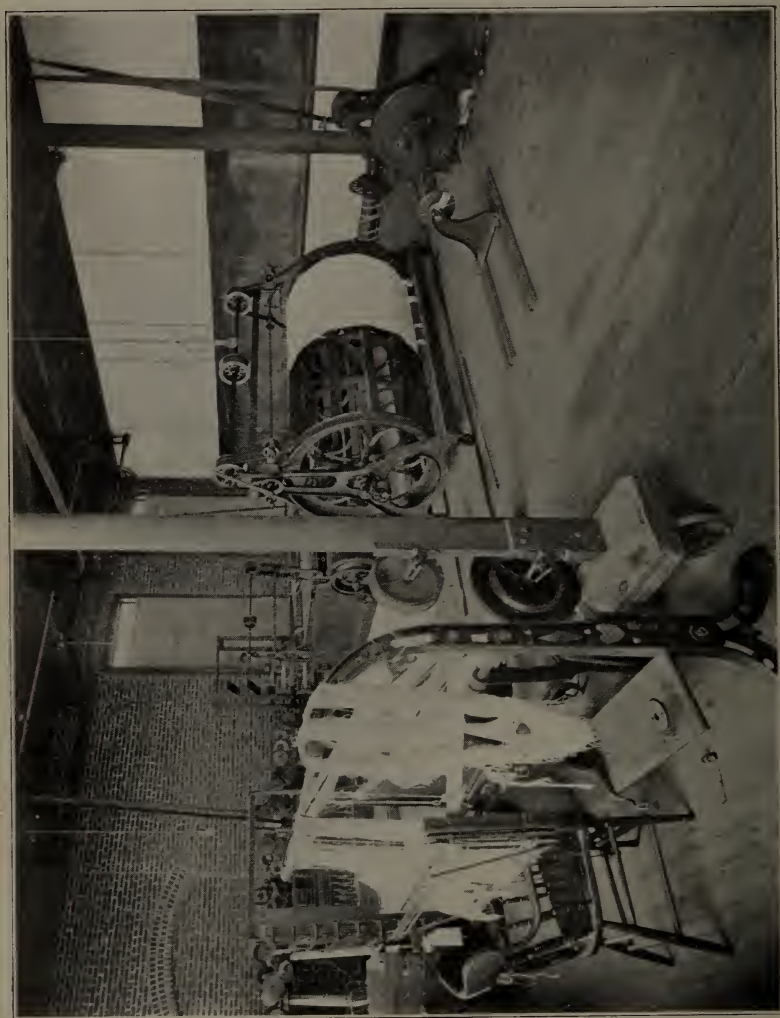
The machinery made by the "Societe Alsacienne de Constructions Mechaniques" at Mulhouse, France, consists of the following:

FRENCH NAMES	ENGLISH NAMES
Gill Box (2 têtes)	Gill Box (2 heads)
Étirage à Frottoirs (2 têtes)	1st Drawing (2 heads)
Étirage à Frottoirs (2 têtes)	2nd Drawing (2 heads)
Étirage à Frottoirs (2 têtes)	3rd Drawing (2 heads)
Étirage Réunion (4 Peignes)	Reducer (4 Porcupines)
Bobinier de Châte (8 Peignes)	Slubber (8 Porcupines)
Bobinier (8 Peignes)	1st Intermediate (8 Porcupines)
Bobinier (8 Peignes)	2nd Intermediate (8 Porcupines)
Bobinier (8 Peignes)	Rover (8 Porcupines)
Finisseur (16 Peignes)	Finisher (16 Porcupines)
Selfacting à Filer (150 Broches)	Selfacting Mule (150 Spindles)

The apparatus in this department for obtaining and preserving the requisite condition of humidity consists of:

Four Humidifiers of the American Moistening Co., Boston, Mass.

Six Steam Thompson Tubo Humidifier Heads from The G. M. Parks Co., Fitchburg, Mass.



WARP PREPARATION

Yarn Weighing and Testing

- From Lowell Scale Company:
 - One Large Platform Scale.
- From Howe Scale Company
 - One Dram Scale.
 - One Gramme Scale.
 - One Ounce Scale.
 - One Pound and Ounce Scale.
- Two Yarn Reels.
- One Roving Reel.
- Three Grain Scales.
- One Run Beam.
- One Hand Yarn Strength Tester.
- Two Twist Counters.
- One Barbour Knotter.

DESIGN AND POWER WEAVING DEPARTMENT

Cotton Warp Preparation

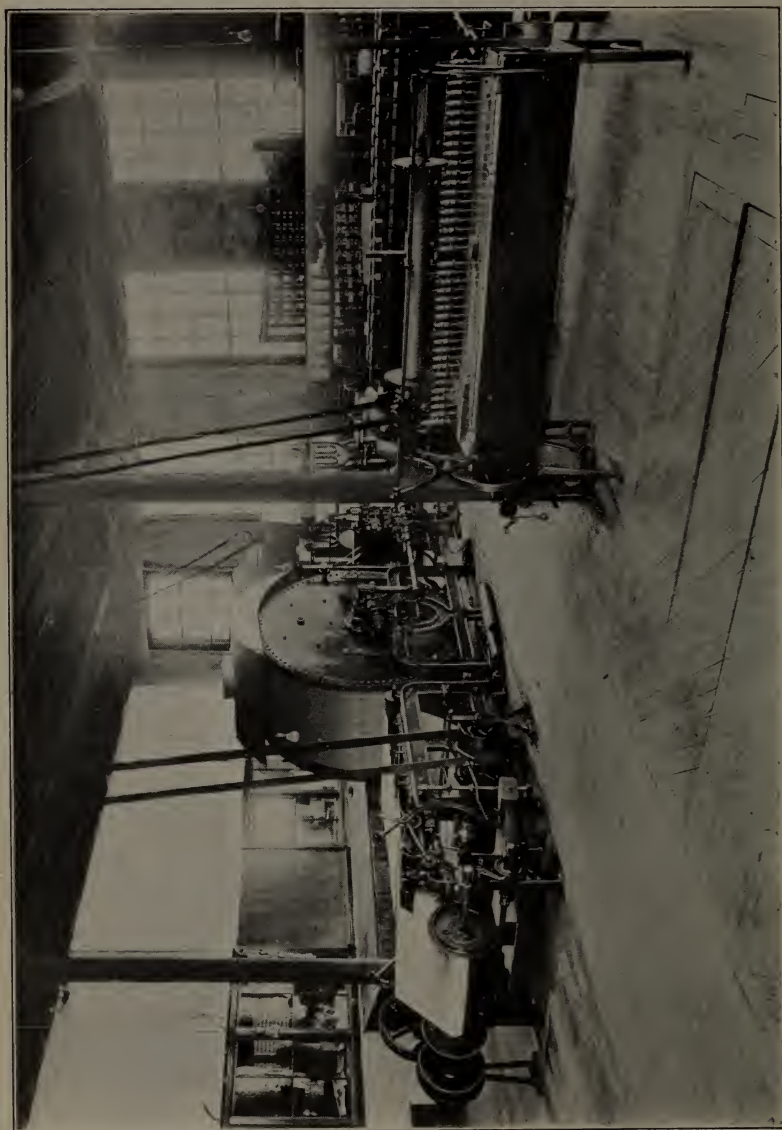
- One Spooler, Lowell Machine Shop, Lowell, Mass.
- One Warper, Lowell Machine Shop, Lowell, Mass.
- One Slasher, Lowell Machine Shop, Lowell, Mass.
- One Beamer, T. C. Entwistle Co., Lowell, Mass.
- One Winder, Altemus & Co., Philadelphia, Pa.
- One 400 End Improved Draper Warper, Draper Co., Hopedale, Mass.
- Drawing-in Frames, etc.
- One Pat. Slasher Press Roll, J. Battles & Co., Lawrence, Mass.
- One Pat. Expansion Comb for Warper, T. C. Entwistle Co., Lowell, Mass.
- One Quiller, Johnson & Bassett, Worcester, Mass.
- Set of six in. spools for Warper, Macrödi Fibre Co., Woonsocket, R. I.
- One Universal Winder for Cop and Bobbin winding, Universal Winder Co., Boston, Mass.

Woolen and Worsted Warp Preparation

- The equipment for this work includes a Jack Spooler, a Dresser, Reel, Beamer and a 48 Spool Creel all made by the Davis & Furber Machine Co., North Andover, Mass. There are also a number of hand warping and beaming frames.

Braiding Machinery

- One 24 Line Hercules Braider.
 - One 12 Line Braider
 - One Tubular Braider.
 - One Sautach Braider.
- All made by the New England Butt Co., Providence, R. I.



WARP PREPARATION

Silk Preparing Machinery

- One Winder, Atwood Machine Co., Stonington, Conn.
- One Ribbon Quiller, Atwood Machine Co., Stonington, Conn.
- One Warper and Beamer, Swiss Style, Atwood Machine Co., Stonington, Conn.
- One Double Frame, Atwood Machine Co., Stonington, Conn.

Plain Looms

- One Plain Northrop Loom, Draper Co., Hopedale, Mass.
- One Plain Print Cloth Loom, Whitin Machine Works, Whitinsville, Mass. To this is attached a Kip-Armstrong Warp Electric Stop Motion.
- One Plain Print Cloth Loom, Mason Machine Works, Taunton, Mass.
- One Kilburn & Lincoln Plain Loom.
- Eight Lowell Machine Shop Plain Looms.
- One English Loom, Hattersley.
- One Improved Northrop Loom, fine sateen, Draper Company, Hopedale, Mass.
- One Northrop Loom with dobby, Draper Co., Hopedale, Mass.
- One Side Cam Twill Loom, Whitin Machine Works, Whitinsville, Mass.
- One Five Harness Sateen Loom, Lowell Machine Shop, Lowell, Mass.
- One Harriman Automatic Shuttle Changing Loom.
- One Lewiston Machine Co. Loom, 4 harness, side cam.
- One Crompton Jean Loom.

Fancy Looms

- One Lewiston Machine Company Bag Loom.
- One Knowles Gingham Loom, 4 boxes, Crompton-Knowles Loom Works.
- One Crompton Gingham Loom, 4 x 1 boxes, Crompton-Knowles Loom Works.
- One Crompton Towel Loom, 2 x 1 boxes, Crompton-Knowles Loom Works.
- One Crompton Lappet Loom, with 16 harness dobby, Crompton-Knowles Loom Works.
- One Knowles Fancy Cotton Loom, 20 harness dobby, 4 boxes, for fancy leno work, Crompton-Knowles Loom Works.
- One Knowles Fancy Cotton Loom, 25 harness dobby, Crompton-Knowles Loom Works.
- One Crompton Fancy Cotton Loom, single cylinder, 20 harness dobby, Crompton-Knowles Loom Works.
- One Knowles Gem Loom, 20 harness, 4 x 4 boxes, Crompton-Knowles Loom Works.



EXPERIMENTAL PRINTING LABORATORY

- One Crompton Worsted Loom, 24 harness, 4 x 4 boxes, Crompton-Knowles Loom Works.
- One Crompton Fancy Loom, 6 x 1 double cylinder, 20 harness dobby, Crompton-Knowles Loom Works.
- One Twenty Harness Dobby Loom, Whitin Machine Works, Whitinsville, Mass.
- One Crompton & Knowles Heavy Loom, 20 harness, 4 x 4 boxes, Crompton-Knowles Loom Works.
- One Knowles Blanket Loom, 25 harness dobby, 4 boxes, Crompton-Knowles Loom Works.
- One Knowles Worsted Loom, 32 harness, 4 x 4 boxes, Crompton-Knowles Loom Works.
- Three Knowles Heavy Woolen Looms, 25 harness, 4 x 4 boxes, Crompton-Knowles Loom Works.
- One Model Dobby Attachment.

Jacquard Looms

- One Knowles Fancy Loom, single lift Jacquard, Crompton-Knowles Loom Works.
- One Knowles Fancy Loom, double lift Jacquard, Crompton-Knowles Loom Works.
- One Knowles Fancy Loom, Jacquard tied up for leno, Crompton-Knowles Loom Works.
- One Knowles Ingrain Carpet Loom, 4 x 4 boxes, Crompton-Knowles Loom Works.
- One Crompton Ingrain Carpet Loom, 4 x 4 boxes, Crompton-Knowles Loom Works.
- One Stafford Silk Loom, 1200 hook Halton Jacquard.
- One Crompton & Knowles 72 in. Tapestry Loom with 2600 hook Halton Jacquard Head.
- One 400 hook single lift, Schaum & Uhlinger Jacquard on Crompton-Knowles 4 bank ribbon loom, Crompton-Knowles Loom Works.
- One 800 hook double lift Knowles Gem Silk Brocade Jacquard Machine, 4 x 4 boxes, Crompton-Knowles Loom Works.
- One Felix Tonnar German Plush Loom.

Card Cutting Machines

- One Jacquard Fine Index Card Cutting Machine, John Royle & Sons, Paterson, N. J.
- One Jacquard French Index Card Cutting Machine, John Royle & Sons, Paterson, N. J.

Hand Loom Weaving

- Twelve Hand Looms, 3 x 3 boxes, 20 harness dobby.
- Eight Hand Looms, 4 x 4 boxes, 24 harness dobby.



VIEWS IN INDUSTRIAL CHEMISTRY LABORATORY

Eight Hand Looms, 3 x 3 boxes, 32 harness dobby.
Six Hand Looms, 4 x 4 boxes, 30 harness dobby.
Two Hand Looms, 4 x 4 boxes, 32 harness dobby.
Two Hand Looms, 4 x 4 boxes, 200 hook Jacquard.
Two Hand Looms, 3 x 3 boxes, 200 hook Jacquard.
Two Hand Looms, 3 x 3 boxes, 600 hook Jacquard.
One Hand Loom, 48 harness. ...
Two Hand Looms with treadles.
Pattern Warping Stands.
Beaming, drawing-in stands, etc.

CHEMISTRY AND DYEING DEPARTMENT

Chemical Laboratories

The General Chemistry and Qualitative Analysis Laboratory includes:
One hundred and twenty laboratory desks, each containing a full set
of apparatus for the first year's work in Chemistry; also gas and
water fittings, reagents and sinks.

Four Large Double Hoods.

Two Steam Baths.

One Parson's Automatic Gas Generator.

Quantitative Laboratory

One Water Distilling Apparatus.

One Steam Drying Closet and Several Drying Ovens.

One Large Steam Bath.

One Electrolytic Table.

Five Hoods.

Thirty-six laboratory desks, each fully provided with apparatus.

Balance Room

One Large Christian Becker Analytical Balance.

Seven Small Christian Becker Analytical Balances.

One Standing Analytical Balance.

One Eimer & Amend Analytical Balance.

One H. L. Becker's Son & Co. Analytical Balance.

Combustion Room

One Combustion Furnace, 25 burners.

One Lothar Meyer's Furnace for tubes.

One Kerosene Burner Muffle Furnace.



VIEW IN COMMERCIAL DYEING LABORATORY

Microscopic and Colorimetric Laboratory

Two Benches for microscopical work.
Three Bausch & Lomb Compound Microscopes.
One Nachet et Fils Compound Microscope.
One Tintometer.
One Ives Colorimeter.
Desks and shelves for the apparatus and reagents necessary for this branch of the work.
Adjoining this Laboratory is a dark room for Spectrum Analysis, Photometric Work, etc.

Assistant Instructors' Laboratory

One Large Case of chemicals.
One Double Hood.
One Copper Water Bath.
One Soapstone Sink with a drain board.
Benches, desks and complete fittings for water, gas and suction.

Private Laboratory

One Groemner Balance.
One Large B. & L. Microscope.
One Parr Calorimeter.
One Case for Chemicals and Apparatus.
Three Laboratory Benches, with necessary fittings.
One Large Hood.
One Steam Bath.
One Experimental Dye Apparatus.
One Porcelain Sink and Drain Board.

Chemical Lecture Room

Is provided with a lecture table fully equipped with gas, water, sinks, a hood and sufficient apparatus for lecture experiments.
An electric arc reflectroscope provided with suitable screen, which makes it possible to illustrate a lecture either from slides or by cuts, photographs or objects.
Seats are provided for 80 students, and are arranged on a raised floor so that every student has a full view of the lecture table.
This room contains various collections of dye stuffs and chemicals for exhibition and for lecture demonstration.

Experimental Dyeing Laboratory

The dyeing laboratory is equipped with individual benches, small dyeing apparatus, reels, balances, apparatus for dye testing, such as frames for exposing dyed material to light, and a complete collection of dyestuff samples and sample cards.



EXPERIMENTAL DYEING LABORATORY

One Small Hydro-Extractor, from W. H. Tolhurst & Son, Troy, N. Y.
Twenty-four Steam Jacketed Experimental Dyeing Machines.
Sixteen Steam Coil Experimental Dyeing Machines.
One Drying Chamber.
One Ageing Chamber.

Experimental Printing Laboratory

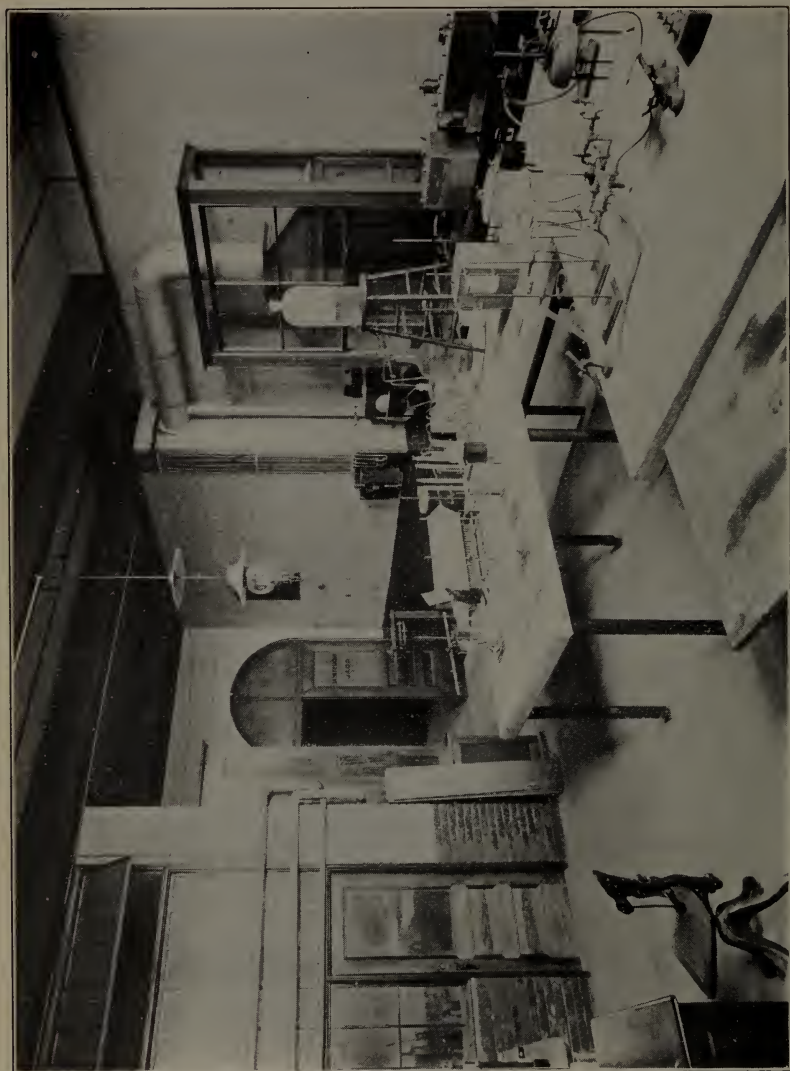
One Calico Printing Machine, made by Mather & Platt, Oldham, England.
One Iron Jacketed Steaming Chamber from A. Edmeston & Son, Salford, England.
One set of Steam Jacketed Copper Kettles.

Fuel and Oil Analysis Laboratory

Mahler Bomb Calorimeter, with complete outfit.
Emerson Bomb Calorimeter, with complete outfit.
Parr Calorimeter.
Abbe Refractometer.
Torsion Viscosimeter.
Tagliabue Viscosimeter.
Tagliabue Cold Test Apparatus.
Pensky Martin Oil Tester.
N. Y. State Oil Tester.
Sartorius Specific Gravity Balance.
Two Becker Analytical Balances.
Gas Muffle Furnace.
Kny Scherer Oil Tester.
Graefe Gas Calorimeter.
Orsat Gas Analysis Apparatus.
Laboratory Tables, Lockers and Hoods.

Industrial Chemistry Laboratory

One Filter Press, Type E, T. Shriver and Co.
One Single Acting Triplex Plunger Pump, Gould's Mfg. Co.
One Vacuum Drying Apparatus, Norman Hubbard's Sons.
One Surface Condenser, Norman Hubbard's Sons.
One Packard Vacuum Pump, Norman Hubbard's Sons.
One Vacuum Evaporator, Swenson System, American Foundry and Machine Co.
One Centrifugal, C. H. Chavant and Co.
One Double Jar Mill, F. I. Stokes and Co.
One Sturtevant Ore Crusher.
One Sturtevant Pulverizer.
Ten Copper Steam Baths, D. H. Wilson and Co.



FUEL AND OIL LABORATORY

One 36 in. Ventilating Fan, Mass. Fan Co.
One Autoclave.
Twenty-four Lockers.
Two Concrete Top Tables.

Commercial Dyeing Laboratory

One Kier, Atlantic Works, East Boston, Mass.
One small Kier, fitted with E. D. Jefferson's circulating device.
One Electrolyzer for manufacturing bleaching solutions, The National Laundry Machinery Co., Dayton, Ohio.
One 4 String Dyeing Machine, Rodney Hunt Machine Co., Orange, Mass.
One Mercerizing Machine.
One Raw Stock Dyeing Machine, Klauder-Weldon Dyeing Machine Co., Amsterdam, N. Y.
One Yarn Dyeing Machine, Klauder-Weldon Dyeing Machine Co., Amsterdam, N. Y.
One Jig Dyeing Machine, The Textile-Finishing Machinery Co., Providence, R. I.
One set of Drying Cans, The Textile-Finishing Machinery Co., Providence, R. I.
One Chain Dyeing Machine, T. C. Entwistle Co., Lowell, Mass.
One Raw Stock Drying Table, Philadelphia Textile Machinery Co., Philadelphia, Pa.
One Padding Machine, Arlington Machine Works, Arlington, Mass.
One Hydro-Extractor, W. H. Tolhurst & Son, Troy, N. Y.
Seven Dye Tubs.
One Power Yarn Reel.
One Reeves' Variable Speed Device.
Two Trucks.

FINISHING DEPARTMENT

One 2 string Washer, Rodney Hunt Co., Orange, Mass.
One Fulling Mill, Rodney Hunt Co., Orange, Mass.
One Up and Down Dry Gig, Curtis & Marble, Worcester, Mass.
One Rolling and Stretching Machine, Curtis & Marble, Worcester, Mass.
One Up and Down Wet Gig, Curtis & Marble, Worcester, Mass.
One Steam Finishing Machine, Curtis & Marble, Worcester, Mass.
One 60 in. 3 burner Singeing Machine, adapted for Cotton, Silk or Worsted goods, Curtis & Marble, Worcester, Mass.
One Two Cylinder Double Acting Brushing Machine, Curtis & Marble, Worcester, Mass.
One 60 in., 4 Cylinder Sanding and Polishing Machine, Curtis & Marble, Worcester, Mass.



QUANTITATIVE LABORATORY

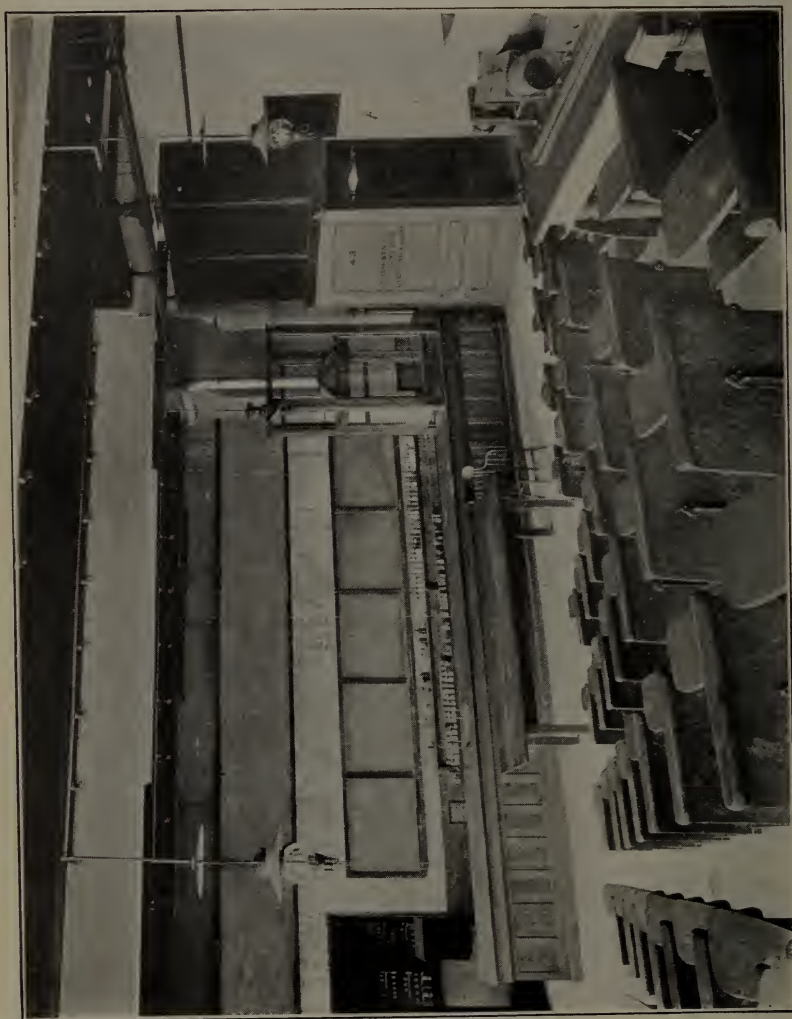
One Kicking Mill, James Hunter & Co., North Adams, Mass.
 One 6-4 Double Shear, Parks & Woolson, Springfield, Vt.
 One Single Shear, Curtis & Marble. Donated by Mass. Mohair Plush Co., Lowell, Mass.
 One Dewing Machine, G. W. Voelker & Co., Woonsocket, R. I.
 One 6-4 Voelker Rotary Press, G. W. Voelker & Co., Woonsocket, R. I.
 One Tentering and Drying Machine, John Heathcote, Providence, R. I.
 One Single Crabbing Machine, H. W. Butterworth & Son, Philadelphia, Pa.
 One 72 in., Woolen Napper, Davis & Furber, North Andover, Mass.
 One 32 in. Basket Hydro-Extractor, W. H. Tolhurst, Troy, N. Y.
 One A. W. C. Measuring and Weighing Machine, Parks & Woolson, Springfield, Vt.
 One Lintz & Eckhardt Cloth Numbering Machine. improved by Durbrow & Hearne Mfg. Co., New York.
 One Steam Press for Underwear, United States Hoffman Co., Syracuse, N. Y.
 One Sewing Machine, Birch Brothers, Somerville, Mass.
 Soap tanks, perch, burling and measuring tables.

ENGINEERING DEPARTMENT

PHYSICAL LABORATORY

Through the generosity of a friend of the School a laboratory has been provided with the most approved apparatus for testing the physical properties of all fibres, yarns and fabrics; the equipment includes:

One Bausch and Lomb D. D. Microscope.
 Two inch, 1 inch, and 1-2 inch regular eyepieces.
 Three-fourths inch (photographic), 2-3 inch, 1-6 inch, 1-12 inch (oil immersion) objectives.
 One Eye-Piece Micrometer.
 One Filar Micrometer, (1 inch equivalent eyepiece) for refined diameter determinations.
 One Standard Glass Stage, divided to 1-10 and 1-100 m. m. with corrections as tested against the International m. m.
 Complete outfit for mounting shades.
 Complete outfit for photo micrography.
 Camera Lucida.
 Microtome Sectioning Outfit.
 One Small Skein Testing Machine.
 One set Conditional Ovens for moisture determination.
 One Yarn Testing Machine, adjusted to test strength, twist, take up, elasticity, and stretch.
 One Hydraulic Cloth Strength Testing Machine.
 One Brown & Sharpe Metre Reel.



CHEMISTRY LECTURE ROOM

Miscellaneous apparatus for experiments in Mechanics, Heat, Light, Sound and Electricity.

The proper conditions of humidity in this laboratory are obtained and maintained by one Thompson Air Turbo Humidifier Head, made and installed by The G. M. Parks Mfg. Co., Fitchburg, Mass, and also by one Humidifier Head made by Schutte & Koerting Co., Philadelphia, Pa.

ENGINEERING LABORATORY

The engineering laboratory contains the following equipment:

- 50 H. P. Allis-Chalmers Corliss steam engine (Reliance type) for experimental purposes arranged to operate condensing or non-condensing and direct connected to an Alden absorption dynamometer.

Wheeler Surface Condenser (200 sq. ft. surface) with 5 in. x 6 in. x 6 in. x 7 in. combined air and circulating pump.

- 25 K. W. Kerr steam turbine (7 stage) direct connected to 25 K. W. Richmond Electric Co. alternating current generator and arranged for both condensing and non-condensing conditions. The piping is also arranged that this turbine may be run as a low pressure turbine in conjunction with the Allis Chalmers engine. The generator is especially designed for experimental work with connections and windings for all the commercial phases.

5000 gallon pressure tank for heads up to 300 ft. and connections for experimental work.

Two 2500 gallon concrete storage tanks.

Complete set of weighing and suction tanks on Fairbanks Standard scales.

Deane Triplex power pump, 4 in. x 6 in.

Clayton air compressor (belted type) 6 in. x 6 in.

Centrifugal pump, 2 inch (belted type), Lawrence Machine Company, Lawrence, Mass.

Two Sturtevant fan blowers for experimental work.

Metropolitan injector.

Differential transmission dynamometer.

Variable speed transmission.

Accessory apparatus such as steam and gas engine indicators, planimeters, thermometers, etc. Apparatus for gas analysis is also available and the chemical department is fully equipped for calorific determinations of fuels.

All steam supplied to the laboratory passes through a 4 inch horizontal Cochrane steam separator to insure dry steam for experimental work.

Buff & Buff Engineers Transit.

Philadelphia level rod.



VIEW OF MANUFACTURED MATERIALS

Apparatus for testing friction and slip of belts and pulleys.
 Standard Westinghouse A. C. generator, switchboard panel with special instruments and connections for 25 K. W. turbo-generator in 2-phase, 3-phase or single phase.
 Westinghouse portable polyphase A. C. wattmeter with series transformers.
 Two General Electric A. C. Ammeters.
 One General Electric A. C. Voltmeter.
 General Electric 3 H. P. induction motor.
 Allis-Chalmers 10 H. P. direct current motor.
 One 4 H. P. G. E. Electric Dynamometer which may be used as a double current generator or rotary transformer receiving direct current at 220 volts and delivering three phase alternating current which by a step-up transformer will give 220 volts at 60 cycles.
 One 250 volt Weston Portable Voltmeter.
 One 250 volt Weston Portable Voltmeter with calibrating coil.
 One 150 ampere Weston Portable Ammeter.
 One Weston Portable Millivoltmeter with 200 milli-volt and 20 milli-volt scales.
 One 2 ampere and one 20 ampere shunt for use with above instrument as an ammeter.
 One D'Arsonval Reflecting Galvanometer.
 One Simple Galvanometer.
 One Wheatstone Bridge.
 Two Direct Current Self Feeding Arc Lamps.
 Two Hand Feed Arc Lamps for stereopticons.
 Resistance boxes of various sizes and other apparatus necessary for commercial testing of lamps, motors, etc.
 An Exhibition Board containing samples of the Chloride and Exide Storage Battery Plates donated by the Electric Storage Battery Co. of Philadelphia.

Machine Shop

The equipment of the machine shop is as follows:

One standard engine lathe, 13 inch swing, 6 foot bed, from Flather & Co., Nashua, N. H.
 One new model quick change engine lathe, 14 in. swing, 6 foot bed, from Flather & Co., Nashua, N. H.
 One standard engine lathe, 18 in. swing, 10 foot bed, with taper attachment, from Flather & Co., Nashua, N. H.
 Two speed lathes, 11 in. swing, 5 foot bed, from J. G. Blount, Everett, Mass.
 One 23 inch upright drill, with back gears and power feed, from J. E. Snyder & Son, Worcester, Mass.



FINISHING DEPARTMENT

One 14 inch single spindle sensitive drill, from the Stanley Mfg. Co., Lawrence, Mass.

One 24 in. x 24 in. x 6 ft. planer, from the Mark Flather Planer Co., Nashua, N. H.

One No. 1, Universal Milling Machine with all three feeds automatic, from the Kempsmith Mfg. Co., Milwaukee, Wis.

One 20 inch wet tool grinder, from J. G. Blount, Everett, Mass.

One 12 inch, two wheel, dry grinder, from J. G. Blount, Everett, Mass.

One 30 inch grindstone and frame, from the Athol Machine Company, Athol, Mass.

One single spindle centering machine, from the D. E. Whiton Machine Co., New London, Conn.

One power hack saw, from the Fairbanks Co., Boston, Mass.

These tools are fully equipped with chucks, centres, tools, etc., for a great variety of work. Benches with vises are also provided for such work as chipping, filing, etc.

A thoroughly equipped tool room contains an ample stock of the best makes of small tools such as drills, taps and dies, milling cutters, reamers, gauges, micrometers, etc.

The following wood working tools are also provided in addition to benches for pattern making:

One pattern maker's lathe, 16 in. swing, 8 foot bed, from Fay & Scott, Dexter, Maine.

One 32 in. band saw, from the Crescent Machine Co., Leetonia, O.

One iron single saw bench, from the Crescent Machine Company, Leetonia, O.

Two blacksmith forges, anvils and tools are also provided, and a gas oven for hardening and tempering tools.

POWER, LIGHT, HEAT AND VENTILATING PLANT

One 300 H. P. Aultman and Taylor Horizontal Water Tube Boiler, equipped with U. S. Rocking Grates.

Two 100 H. P. Stirling Water Tube Boilers.

These boilers are connected to a Sturtevant Induced Draft Apparatus, including fan, direct connected to the Sturtevant vertical engine and equipped with two way dampers. One of the Stirling Boilers is so piped that it may be cut off from the regular plant in order to supply the Engineering Laboratory only.

One Sturtevant Smoke Filtering Apparatus.

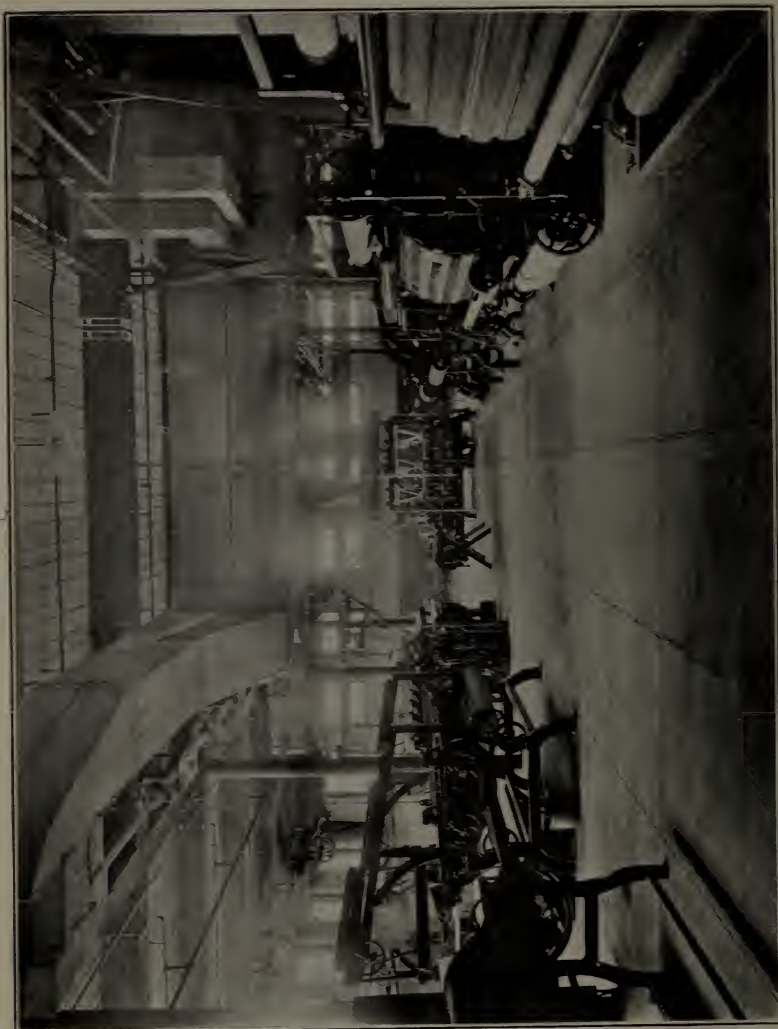
One Locke Steam Pressure Regulator for draft engine.

One Knowles Boiler Feed Pump, 6 in. x 4 in. x 6 in.

One Warren Webster Feed Water Heater, Filter and Oil Extractor.

One Payne 14 in. x 14 in. Automatic High Speed Engine of 125 H. P.

One 9 1-2 in. x 11 3-4 in. Nash Gas Engine of 50 H. P. of the four cycle type, with speed regulating clutch and hit and miss governor.



FINISHING DEPARTMENT

One Motor Driven Air Compressor 5 1-2 in. x 6 in. with a storage tank of 20 cubic feet capacity, 100 lbs. per sq. in. pressure.

One Complete Sturtevant Double Duct System for heating Southwick Hall. This apparatus is designed to provide the proper amount of fresh warm air called for by the State law as applied to educational institutions, and includes a 9 ft. x 4 ft. fan direct connected to the Sturtevant horizontal engine, drip tank and Knowles automatic return pump, 4 1-2 in. x 2 3-4 in. x 4 in. arranged to deliver either to the feed water heater or to the boilers direct.

Complete Ventilation System for Southwick Hall and Falmouth Street Building including 6 direct connected motor driven exhaust fans.

One Sturtevant Fan and Heater for Kitson Hall and Falmouth Street Building, direct connected to a Sturtevant inverted engine.

One Cross Oil Filter.

One Complete Moistening Apparatus installed by the American Moistening Co., Boston, Mass., including Knowles triplex 4 x 4 power pump, tank, and 20 moistening heads.

One Moistening Apparatus with Thompson's Turbo Heads, installed in French Spinning Department, by the G. M. Parks Co., Fitchburg, Mass.

One Complete Sprinkler System for fire protection, using the Grinnell glass button heads.

One Bullock 75 K. W. Direct Current Multipolar Compound Generator, wound for 220 volts, over compounded 20 volts from no load to full load. This is direct connected to the Payne engine.

One Bullock 30 K. W. Generator of the same type, direct connected to the Nash gas engine.

The switchboard is arranged so that either unit may be thrown in independently on the power or lighting feeders or the two machines may be run in parallel. The lighting circuits are on the two wire 220 volt system and supply the equivalent of 1030—16 candle power lamps.* The power circuits are on the same system and supply approximately 170 H. P. in motors.

Three 24 H. P. Bullock Motors.

One 20 H. P. General Electric Motor.

Two 10 H. P. Allis Chalmers Motors.

Two 7 1-2 H. P. General Electric Motors.

Four 15 H. P. Bullock Motors.

One 3 H. P. Motor, New England Motor Co.

One 2 H. P. Motor, Holtzer-Cabot Electric Co.



KITSON HALL

ATHLETIC FIELD

SOUTHWICK HALL

ATHLETICS

Through the generosity of Mr. Frederick Fanning Ayer, the school has been provided with a Campus and Athletic Field of about three acres. This has been carefully graded and laid out for base ball, foot ball and track athletics. Bleachers have been provided for use at the out-of-door games.

In the basement of Kitson Hall there has been provided a recreation room for the use of the students at such times as their attendance is not required in classes. This room is also used by those who take part in athletics, and connected to it is a smaller room provided with shower baths, lockers and toilets. Both rooms are easily accessible to the Campus by way of the outer door of Kitson Hall.

Last year a beginning was made in equipping the upper hall of Southwick Hall with gymnastic apparatus. Chest weights, wooden dumb bells, Indian clubs, a set of travelling rings, a vaulting horse, parallel bars, a punching bag and several sets of foils and single sticks have been provided.

This year the services of a physical director have been engaged and optional classes have been held in gymnasium work. It is proposed to extend this work further in the near future, making it a part of the regular school program. This will be done as far as the time and arrangement with other classes will permit.

In order to assure that no student having any dangerous physical weakness should take part in any athletic contest, all candidates for the various athletic teams are obliged to pass a satisfactory physical examination given by the Medical Adviser of the school. This part of the work will undoubtedly be broadened to include a thorough physical examination of every incoming student and to carefully follow his physical development during his course at the school.



MACHINE SHOP

DAY CLASSES

Entrance Qualifications

Candidates for admission are accepted upon presentation of properly vouched certificates showing the completion of a regular four year course in High School or Academy of reputable standing. The certificate must specify that the applicant has satisfactorily passed the subjects hereafter listed for entrance examinations. For all others, there are held examinations, as stated in calendar; candidates failing to pass at June examinations are allowed to try again in September; those who cannot attend the June examinations, may present themselves in September.

The Calendar of examinations is as follows:

Monday, June 20, 1910; September 12, 1910; and June 19, 1911:

Algebra	9 to 11 A. M.
Geography	11 A. M. to 1 P. M.
English	2 to 4 P. M.

Tuesday, June 21, 1910; September 13, 1910; and June 19, 1911:

Geometry	9 to 11 A. M.
History	11 A. M. to 1 P. M.
Arithmetic	2 to 4 P. M.

Algebra

Fundamental operations, parenthesis; factoring; highest common factor; least common multiple; fractions, simple and complex; simple equations, one or more unknown quantities; radicals; involution and evolution; square and cube root; logarithms; ratio and proportion; exponents, including fractional and negative.

Plane Geometry

As much plane geometry as is included in any of the generally accepted text books. The student should be familiar with properties of plane rectilinear figures, the measurement of angles, the circle, polygons, etc. He should be able to make applications to the measurement of lines and plane figures.

Arithmetic

Definitions; elementary, operations in addition, subtraction, multiplication and division; squares; cubes; square root; interest, discount; fractions, simple and complex; decimals; percentage, alligation; ratio and proportion. Metric System.



MECHANICAL DRAWING ROOM

English

The applicant must have such knowledge of the following books as will enable him to discuss intelligently their subject matter, literary form and structure. He will also be expected to be familiar with the lives of the authors, and with the important historical events associated with the books.

For June and September, 1910:

Shakespeare's *Macbeth*.

Sir Roger de Coverley Papers in the *Spectator*.

Coleridge's *The Ancient Mariner*.

Scott's *Ivanhoe*.

Macaulay's Essay on Addison.

Tennyson's *Lancelot and Elaine*, and *The Passing of Arthur*.

Burke's Speech on Conciliation with America.

Franklin's *Autobiography*.

George Eliot's *Silas Marner*.

For June and September, 1911:

Shakespeare's *Julius Caesar*.

Addison's Sir Roger de Coverley Papers.

Scott's *Quentin Durward*.

Dickens' *Tale of Two Cities*.

Irving's *Sketch Book*.

Coleridge's *Ancient Mariner*.

Burke's Speech on Conciliation with America.

Macaulay's *Life of Johnson*.

For June and September, 1912:

Shakespeare's *Macbeth*.

Addison's Sir Roger de Coverley Papers.

Scott's *Ivanhoe*.

Thackeray's *Henry Esmond*.

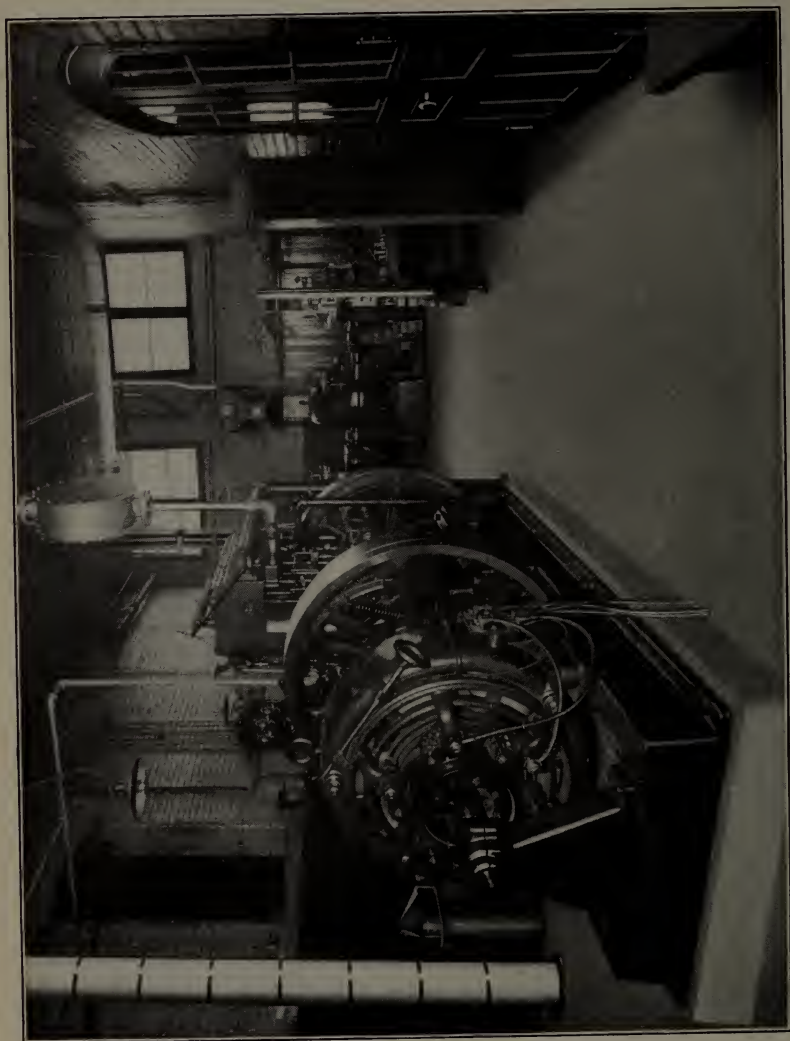
De Quincey's *Joan of Arc* and *The English Mail Coach*.

Tennyson's *Gareth and Lynette*, *Lancelot and Elaine*, and the *Passing of Arthur*.

Burke's Speech on Conciliation with America.

Carlyle's Essay on Burns.

The applicant will be required to write two or three short themes on subjects taken from the above mentioned books. The examination in English, however, will test, primarily, the ability of the applicant to express himself with clearness and accuracy. In all cases, knowledge of the books will be considered of less importance than the ability to write clear and correct English. Evidence of serious weakness in spelling, punctuation, grammar and division into paragraphs will be considered sufficient ground for rating such work as a failure. The applicant may be required to correct examples of bad grammar and punctuation.



GAS ENGINE UNIT—ENGINE ROOM

English written in any other admission examination may, if necessary, be considered by the examiner as part of the examination in English.

Geography

(Not required in 1911 and thereafter)

Location of principal countries, with capitals, large rivers, mountains, etc., noting characteristics of climate, productions and inhabitants. General statements rather than specialization are sought.

Modern Languages

Beginning with June, 1911 all applicants must pass entrance examinations in either Elementary German or Elementary French, and all applicants entering upon certificate must state in which of these subjects or both they have received preparation and the ground covered by such preparation. The student must continue through the first year with the branch that is presented at entrance.

Students contemplating the Chemistry and Dyeing Course should present German; those entering for Textile Designing, French; for all other courses either French or German. It is expected that within a few years, applicants will be required to present both French and German, and it is therefore recommended that all students now attending preparatory schools pursue courses in Elementary French and German.

German:

Entrance examination in German will be composed of two parts, both taken however, at the same time.

- (a) Translation of simple German prose into good idiomatic English.
- (b) Questions to test proficiency in grammar and simple English sentences to be rendered into German.

The requirements of Elementary German include the declension of articles, adjectives, pronouns, and nouns; the conjugation and inflection of weak and strong verbs; the uses of the modal auxiliaries; the prepositions and their government; the principal parts of important verbs; the elementary rules of syntax and word order.

Among the texts recommended for prospective candidates are:

Andersen's Märchen.

Arnold's Fritz auf Ferien.

Baumbach's Die Nonna and Der Schwiegersohn.

Gerstäcker's Germelshausen.

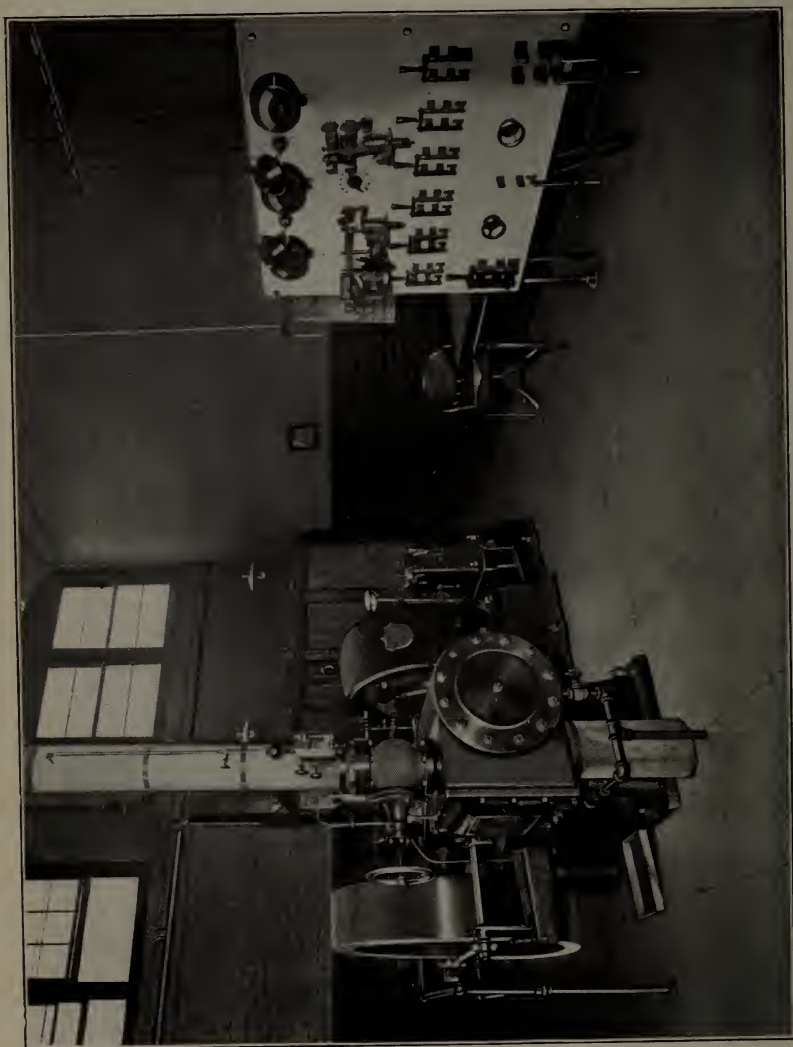
Heyse's L'Arrabiata.

Hillern's Höher als die Kirche.

Jensen's Die braune Erica.

Storm's Immensee.

Zschokke's Der zerbrochene Krug.



STEAM ENGINE UNIT—ENGINE ROOM

French:

Entrance examination in French will consist of the following:

- (a) Translation of simple French prose into good idiomatic English.
- (b) Questions to test proficiency in grammar and simple English sentences to be rendered into French.

The requirements of Elementary French include the principal parts, conjugation and inflection of the regular and the more common irregular verbs; the singular and plural forms of nouns and adjectives; the uses of articles and partitive constructions; the forms and positions of personal pronouns; and the simpler uses of the conditional and subjunctive.

Among the texts recommended are:

About's *Le roi des montagnes*.

Bruno's *Le tour de la France*.

Daudet's *esasier* short tales.

De la Bédollière's *La mère Michel et son chat*.

Erckmann — Chatrian's *Madame Thérèse*.

Foa's *Contes Biographiques*.

Halévy's *L'Abbé Constantin*.

Merimée's *Colomba*.

Extracts from Michelet.

Sarcey's *Le siège de Paris*.

Verne's *Le tour du monde en quatre-vingts jours*.

American History

Applicants must show familiarity with the early settlements in America, the colonies, their government, the customs of the people and events which led to the establishment of the United States. They should be informed concerning the causes and effects of the principal wars in which the country has been involved. Applicants should be prepared to consider questions involving a knowledge of Civil Government as well as historical facts, connected with the growth of this country up to the present time.

Preparation

Particular stress is laid upon a thorough grounding in mathematics including Algebra, Arithmetic and Plane Geometry, as these form the basis upon which the work of this school rests. A preliminary course in science, including Physics and Chemistry, serves to prepare the student's mind for the higher branches of these subjects and their application.

Advanced Standing

Candidates who may have received previous training in any of the subjects ordinarily taken in the regular course may present themselves



BOILER ROOM

for examination as per calendar. If a satisfactory rank be attained, they will be given such further work as will be best suited to their advancement.

Attendance Card

At the beginning of each term all students must fill out and file with the Principal on blank forms which are provided, a formal application for such subjects as are required in his course and for which he is sufficiently prepared, subject to the approval of the Principal. When an attendance card is once approved, no change can be made except through the Principal.

Application Blanks

A blank form of application for admission may be found at the end of this bulletin. This should be properly filled out by all applicants whether entering upon certificate from a preparatory school or presenting themselves for examinations.

Fees

The fee for the day course is \$100 per year for residents of Massachusetts, with the exception of the Chemistry and Dyeing Course, for which the fee is \$125 for Second and Third Year students. For First Year students taking the Chemistry and Dyeing Course the first term fee is \$60 and the second term fee \$52.50. For non-residents the fee for all courses is \$150 per year. Fee for students from foreign countries \$300 per year.

Three-fifths of the fee is charged for a single term and is payable on or before October 10, the balance on or before February 10, of each year. Students attending but one term will be charged three-fifths of the yearly fee. After payment is made, no fee or part thereof can be returned, except by special action of the Trustees.

Special students pay, in general, the full fee, but if a course be taken involving attendance at the school during a limited time, application may be made to the Principal for a reduction.

Students must provide their own books, stationery, tools, etc., and pay for any breakage or damage that they cause. The above fee includes free admission for any day student desiring to attend any of the evening classes in which there is accommodation.

For all first year students a minimum deposit of \$20 is required to cover the cost of breakage in the chemical laboratory, the unexpended balance to be returned to the student at the end of the year.

For all students in second or third years taking work in Chemistry or Dyeing Laboratories a deposit of \$15 per term is required. The unexpended balance will be returned at end of year.



LECTURE ROOM—ENGINEERING DEPARTMENT

The fees for the evening classes are indicated under Evening Classes for which see page 29.

Fees are strictly payable in advance, and students whose fees remain unpaid after the above mentioned dates will not be admitted to classes.

All deposits must be made before students can be admitted for laboratory work.

Examinations

Examinations are held at the end of each term.

In general, the examinations cover the work of the preceding term, but at the end of the third year, candidates for diplomas may be examined on all of the preceding three years' work.

Examinations for students conditioned in first term subjects are held in May and examinations for students conditioned in the Final Examinations are held in September following.

If a student fails to clear a condition at the time appointed he will be required to repeat or drop the subject; and he cannot be admitted to subjects dependent thereon.

Intermediate examinations are held every five weeks and these serve to inform the student concerning his standing and the progress made.

Daily work and regularity of attendance are considered in making up the reports of standing.

Continued or persistent absence (or tardiness) from the classes is considered reason to exclude a student from the class.

Records and Reports of Standing

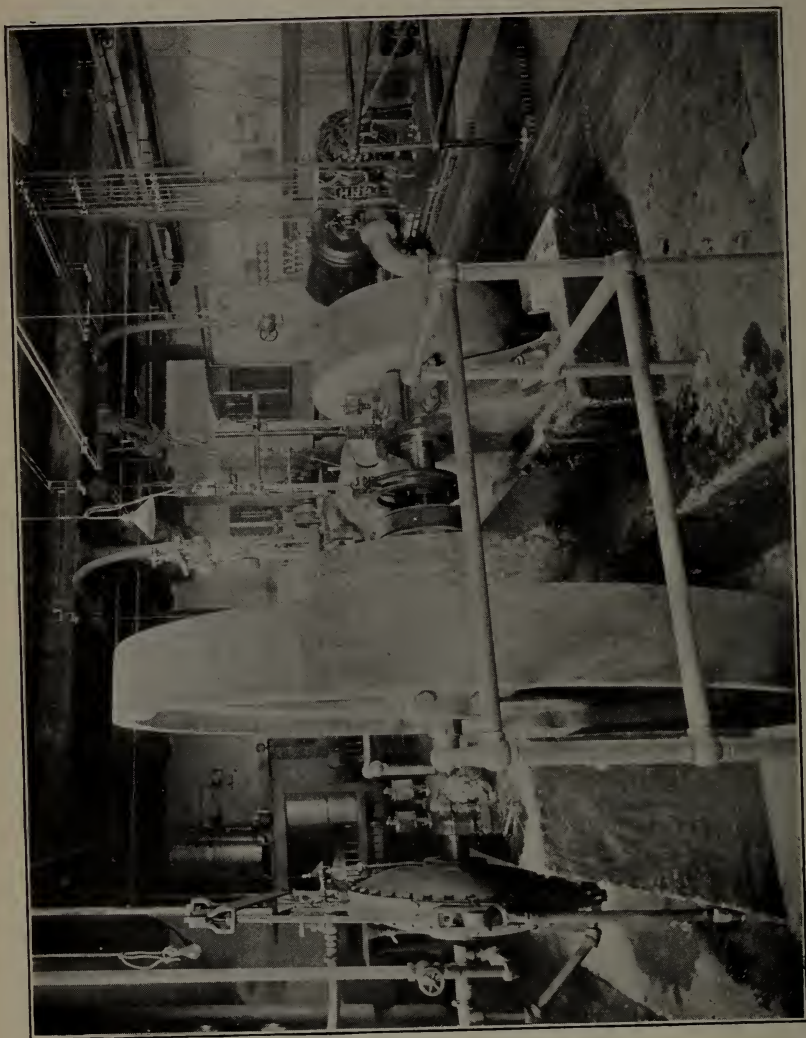
Twice during each term informal reports are sent to students, or to guardians of such as are not of age; and at the end of each term formal reports are made.

The daily work of the student forms an important part of his record, and no pupil will be awarded the diploma unless this portion of his record is clear.

Books are prescribed for study, for entry of lecture notes and other exercises, and are periodically examined by the lecturers. The care and accuracy with which these books are kept are considered in determining standing.

Thesis

All candidates for the diploma of the school must file with the Principal not later than May 15, a report of original investigation, or research, written on a good quality of paper, 8x10 inches, with one inch margin at left, and 1-2 inch at right of each page; such thesis to have been previously approved by the head of the department in which it is made.



ENGINEERING LABORATORY

Graduate Course

Graduates of technical courses of other schools are invited to communicate with the Principal with reference to special courses in the textile studies. Previous training in the engineering branches will usually reduce materially the time necessary to complete any of the courses at this school. The advantages offered to such persons for special research work are unexcelled, and a most profitable course may be arranged.

The Regular Courses

The title of each of the regular courses is an indication of the particular nature of the course, unless it be in the case of Course III. There is a considerable demand for a general textile course in which the whole subject may be treated broadly, and this course is organized with this particular object in view. Certain general studies are included in each course, in order that in specializing, a too narrow view may be avoided.

While it is always urged that regular courses be followed as far as possible, there is opportunity to take any of the subjects taught for which the student is prepared, providing the schedule will permit. All students contemplating a special course should consult with the principal.

Special Awards of Merit

For several years a friend of the school has offered prizes in the form of books to be awarded to the successful candidates on graduation day. These prizes are continued this year. The conditions in detail are as follows:

First:—Ten dollars to the student taking the regular Chemistry and Dyeing course in the Lowell Textile School, who shall be considered as having attained the highest scholarship in First Year Chemistry.

Second:—Five dollars to the student taking the regular Chemistry and Dyeing course in the Lowell Textile School, who shall be considered as having attained the second highest scholarship in First Year Chemistry.

Third:—Ten dollars to the regular student of the Chemistry and Dyeing course who shall be considered as having attained the highest scholarship during his second year.

Fourth:—Five dollars to the regular student of the Chemistry and Dyeing course who shall be considered as having attained the second highest scholarship during his second year.

Fifth:—Ten dollars to the regular Chemistry and Dyeing student of either the second or third year class who shall write the best article upon one of five subjects to be specified by the instructing staff of the Chemistry and Dyeing Department.



DECORATIVE ART DEPARTMENT

Sixth:—Twenty dollars to the regular student in the Chemistry and Dyeing course who shall present the best Thesis preparatory to graduation.

The above mentioned sums are to be invested in books which may be selected after graduation. In case no one is considered as being worthy of any particular scholarship prize the same may be withheld. The decision in such case shall rest with the judges.

Diploma

The diploma of the School is awarded upon the satisfactory completion of any one of the regular courses, covering not less than three years, except where entrance is to advanced standing. In such cases at least one year's attendance is required.

Medals of Honor

The National Cotton Manufacturers' Association offers annually a medal to that member of the graduating class from the Cotton Manufacturing course, selected because of his standing and general ability, as best fitted to receive it.

Attendance

All regular students must attend all exercises of their course. Special students must attend exercises as per their Tabular View.

In case of absence explanation must be made to the instructor or the Head of the Department. The effect of such absence upon a student's standing in the respective study will rest with the Head of the Department, subject to the approval of the Principal.

If a student absents himself from any department to such an extent that in the mind of the Head of the Department he is endangering his standing, he shall be reported to the Principal.

If he continues his non-attendance he may be required to drop the subject and repeat it the following year.

If he is reported from several departments on account of non-attendance, he may be suspended from the school for the remainder of the school year.

Conduct

Students are required to return to the proper place all instruments or apparatus used in experimental work and to leave all machinery and apparatus with which they may experiment clean and in working order. All breakages, accidents, or irregularities of any kind must be reported immediately to the head of the department, or instructor in charge.

In cases of either day or evening students, irregular attendance, lack of punctuality, neglect of either school or home work, disorderly or ungentlemanly conduct or general insubordination, are considered good and sufficient reason for the immediate suspension of a student, and a report to the Trustees for such action as they deem necessary to take.

It is the aim of the Trustees so to administer the discipline of the school as to maintain a high standard of integrity and a scrupulous regard for trust. The attempt of any student to present as his own, work which he has not performed, or to pass any examination by improper means, is regarded by the Trustees as a most serious offense and renders the offender liable to immediate suspension or expulsion. The aiding or abetting of a student in any dishonesty is also held to be a grave breach of discipline.

Any student who violates these provisions will be immediately suspended by the Principal and the case reported at the following meeting of the Trustees for action.

Young men abounding in vitality when suddenly cut loose from home and established social environment to acquire an education at a residential school need especially the careful direction of more mature minds in the formation of new associations. The managements of all residential schools are aware that this fact is the cause of considerable anxiety on the part of parents and guardians. The responsibility thus placed upon those under whose care these pupils are committed is profoundly recognized.

The public schools are for boys and girls, the college for youth, the higher technical and professional schools of medicine, law, engineering, etc., are for men. It is now fully recognized that the fundamental idea of the general educational system, from the kindergarten to the college inclusive, should be the development and establishment of character, and it is therefore expected that those entering the technical schools will have made some progress in self-respect, self-denial and self-control. They enter substantially upon their life work when they matriculate at the higher technical schools and may be placed on their honor as to conduct and not be subject to an irritating and humiliating system of espionage outside of school hours.

In place of such espionage it is the policy of technical schools to rely mainly upon the discipline of the work of the course in connection with ample facilities for physical exercise in the various athletic games and sports, for which ample provision has been made at this school.

Pupils often err in conduct from thoughtlessness and lack of experience rather than through wilfulness, and unconsciously fall into bad habits because of the lack of intelligent warning and instruction. For this reason, it is proposed to give thorough instruction by lectures, covering the subjects of hygiene, the preservation of physical vigor, morals, thrift, the duties of citizenship, etc. A careful scrutiny will also be maintained by

the instruction staff in order to detect in the students any tendency of relaxation in the work or attendance, and all reasonable effort will be made to maintain a high standard of scholarship and morals.

Library

The school library is supplied with leading textile books and with works dealing with science, art or industries allied to the textile trades. The leading textile papers are kept on file.

Sessions

The regular school sessions are in general from 8.30 a. m. to 12.30 p. m., and from 2 to 4.30 p. m., except Saturdays when the buildings are closed in the afternoon.

A tabular view designates the hours at which the various classes meet. This is rigidly adhered to and the student is marked for his attendance and work as therewith scheduled.

General

Students from a distance, requiring rooms and board on the city, may if they desire it, select the same from a list which is kept at the School. The cost of rooms and board in a good district is from \$6.50 per week upwards.

All raw stock and yarn provided by the School, and all the productions of the School remain, or become, the property of the Trustees, except by special arrangement, but each student is allowed to retain specimens of yarn or fabrics that he has produced, if mounted and tabulated in accordance with the requirements of the school. It is understood that the Trustees may retain in the School such specimens of student's work as they may determine.

Apparatus used in the Dyeing or Chemical Laboratory is provided by the School, but a deposit must be made by the student at the beginning of the term sufficient to cover its cost, and this deposit will be returned to him at the close of the term, subject to such deduction as will reimburse the School for broken or damaged articles and material used.

Lockers are provided for the use of students, sufficiently capacious to contain clothing, books and tools. The student must provide a good padlock with duplicate keys, one of which must be delivered at the school office where it will be preserved for use while the student remains at school.

No books, instruments, or other property of the School are loaned to the students, to be removed from the premises except by special permission.

Materials

Students must purchase such tools, instruments, text books, and apparatus as may from time to time be recommended by the head of each department, and the cost of these for day students is from \$20 to \$25, and for evening students from \$1 upwards according to the subject studied.

Awards

Gold Medal, Paris Exposition, 1900, for general excellence. A special Medal, Merchants and Manufacturers Exposition, Boston, 1900. The Pan-American Medal awarded to the School, 1901. Gold Medal, Louisiana Purchase Exposition, 1904. Gold Medal, Lewis and Clarke Centennial Exposition, 1905.

Bulletins and Catalogue

All students registering and paying the regular fee for the course selected are entitled to the Bulletins and Catalogues when issued.

Special bulletins descriptive of the Chemistry and Dyeing Course, the Wool Manufacturing Course, the Cotton Manufacturing Course, the Designing Course and the Textile Engineering Course have been prepared and may be obtained upon application.

COURSES OF INSTRUCTION

In the column headed "Hours of Exercise" the numbers represent for each particular subject the total hours required for a period of fifteen weeks.

For detail description of the subjects see page 100.

FIRST YEAR

FIRST TERM

(Common to all courses)

	Hours of Exercise	
Elements of Mechanism	60	
Mechanical Drawing	112	
Mathematics,—Algebra	45	
Hand Loom Weaving and Elements of Design	68	
General Chemistry	158	
Decorative Art	}	15
Freehand Drawing		
English		15
German or French		30

COURSE 1.—COTTON MANUFACTURING

The Cotton Manufacturing Course is designed for students contemplating a career in the manufacturing of cotton yarns and cloths or allied industries.

During the first term of the first year, the studies are common to all courses and include instruction in elementary mechanism, mathematics, mechanical drawing, general chemistry and decorative art. Laboratory work supplements the lectures in chemistry and hand loom weaving assists in illustrating the principles of textile design.

The work in the Cotton Yarn Department comprises instruction in all the processes from the bale to the finished yarn. The instruction consists of lectures upon the machines and processes, and laboratory work upon the machines themselves. In the laboratory each student is required to make exhaustive tests upon each machine and all the settings and adjustments possible. The third year's work in this department is largely devoted to lectures upon the manufacture of specialties, waste products, etc., and special laboratory work, special tests upon yarns and fabrics, mill planning with regard to the arrangement of machinery and other work of an advanced nature.

The course in chemistry consists of lecture and laboratory work on inorganic chemistry followed by instruction in textile chemistry and dyeing, including a short course in the dyeing laboratory.

The work in mechanism is followed by steam engineering, electricity, hydraulics and mill engineering. The mechanical drawing taken in connection with these subjects augments this instruction as well as provides opportunity for students to become skilled in draughting.

The course in designing, cloth analysis, and cloth construction includes lectures on plain and fancy weaves and Jacquard work, the analysis of all commercial fabrics, and designs for the same. During the third year of this course students in this department specialize on cotton fabrics.

Power weaving is taken up during the second and third years. Commencing with lectures and practice upon plain looms, the student is taken through dobby and box-loom weaving to Jacquards.

A course in knitting taken during the third year includes the manufacture of hosiery and underwear. There is also a course of lectures on the finishing of cotton fabrics.

For detail description of the subjects see page 100.

COURSE I.—COTTON MANUFACTURING

FIRST YEAR

(For First Term see page 89)

SECOND TERM

	Hours of Exercise		Hours of Exercise
Cotton Carding and Drawing	142	Textile Chemistry	15
Textile Design, Cloth Analysis	60	Freehand Drawing and Decorative	
Hand Loom Weaving	38	Art	15
Elements of Mechanism	45	Mechanical Drawing	60
Mathematics	30	German	30
Elementary Organic Chemistry	60	English	15

SECOND YEAR

FIRST TERM

Cotton Spinning	248	Mechanical Engineering	30
Textile Design, Cloth Analysis	60	Power Loom Weaving	30
Textile Chemistry and Dyeing	30	Physics	30
Machine Drawing	37	Industrial History	15
Weaving Mechanism	30		

SECOND TERM

Cotton Spinning	180	Power Loom Weaving	60
Textile Design, Cloth Analysis	60	Machine Drawing	38
Textile Chemistry and Dyeing	82	Physics	15
Mechanical Engineering	30	Industrial History	15
Electrical Engineering	30		

THIRD YEAR

FIRST TERM

Cotton Yarn Manufacture	180	Knitting Machinery	30
Textile Design	30	Power Loom Weaving	165
Cloth Analysis	30	Mill Engineering	30
Cotton Finishing	30	Electrical Engineering	15

SECOND TERM

Cotton Yarn Manufacture and Thesis	210	Mill Engineering	45
Textile Design, Cloth Analysis	60	Knitting Machinery	30
Power Loom Weaving	135	Cotton Finishing	30

COURSE II.—WOOL MANUFACTURING

The course of Wool Manufacturing is arranged for those who contemplate a career in the manufacture of woollen or worsted fabrics. It includes instruction in all of the varied processes employed in adapting the wool fibre to cloth, namely,—sorting, scouring, carding, combing, spinning, designing, weaving, dyeing and finishing. The work is carried on by lectures, recitations and practical work in the laboratories.

Following the first term, which is common to all courses, the student in his second term commences work in the Woollen and Worsted Laboratory, and through systematic steps is acquainted with the machines employed in the first steps of yarn manufacturing. At the same time lectures are given upon the many kinds of wool, variation in quality, grades, uses, etc., as influenced by the locality where grown. This is followed by practical work on the sorting table.

The second and third years cover spinning of woollen yarn and worsted yarn by the Bradford and French systems, also the manufacture of tops, including combing, gilling and back washing. Scouring and carbonizing are taken up in detail by lectures and by practical work.

The general chemistry of the first year leads to organic chemistry, followed by textile chemistry and dyeing in the second year. This includes a short course in the Dyeing Laboratory.

Textile designing, cloth analysis and construction are continued from the first year throughout the course, the work being applied especially to woollen and worsted goods. Weaving on power looms commences in the second year and continues through the third.

Lectures on finishing commence with the third year and are augmented by extensive practice with the machines in the Finishing Department.

Work in the Engineering Department extends throughout all three years and includes mechanical drawing, properties of saturated steam, electricity and hydraulics. The practical application of the principles studied in these subjects is brought out forcibly in the work on mill engineering, where mill design and construction are considered. A short course covering methods employed in the testing of fibres, yarns and cloths, together with laboratory work in the manipulation of certain physical apparatus, is given in the third year.

For detail description of the subjects see page 100.

COURSE II.—WOOL MANUFACTURING

FIRST YEAR

(*For First Term see page 89.*)

SECOND TERM

	Hours of Exercise		Hours of Exercise
Woolen Carding and Spinning	120	Textile Chemistry	15
Textile Design, Cloth Analysis	60	Freehand Drawing and Decorative	
Hand Loom Weaving	38	Art	15
Elements of Mechanism	45	Mechanical Drawing	75
Mathematics	30	German	30
Elementary Organic Chemistry	60	English	15

SECOND YEAR

FIRST TERM

Wool Sorting, Scouring and		Weaving Mechanism	30
Woolen Spinning	247	Mechanical Engineering	30
Textile Design, Cloth Analysis	60	Power Loom Weaving	30
Textile Chemistry and Dyeing	30	Physics	30
Machine Drawing	38	Industrial History	15

SECOND TERM

Wool Sorting, Worsted Carding,		Electrical Engineering	30
Combing and Spinning	180	Power Loom Weaving	60
Textile Design, Cloth Analysis	60	Machine Drawing	38
Textile Chemistry and Dyeing	82	Physics	15
Mechanical Engineering	30	Industrial History	15

THIRD YEAR

FIRST TERM

Wool Sorting, Worsted Spinning,		Power Loom Weaving	172
English and French Systems	128	Finishing	75
Textile Design	30	Mill Engineering	30
Cloth Analysis	30	Knitting	30
Electrical Engineering	15		

SECOND TERM

Wool Sorting, Worsted Spinning,		Thesis	
English and French Systems	180	Finishing	75
Textile Design, Cloth Analysis	60	Mill Engineering	45
Power Loom Weaving	120	Knitting	30

COURSE III.—TEXTILE DESIGN

The general course in Textile Design is planned to meet the demand of young men for a technical training in the general processes of textile manufacturing, but with particular reference to the design and construction of fabrics. To this end a foundation is laid in the first year by instruction in mechanics, mechanical drawing, mathematics, chemistry and the elementary principles of designing and weaving. The student is required to pursue a course in the yarn departments, both cotton and wool. By this method he acquires a knowledge of the manufacture of cotton yarns from the bale to the yarn and of woolen and worsted yarns from the fleece through the varied processes of manufacturing woolen yarn or worsted yarn by both the French and Bradford Systems.

Throughout his entire course he receives instruction in design, cloth analysis and construction of all the standard cloths, viz.—trouserings, coatings, suitings, blankets, velvets, corduroys, plushes, etc. This leads into advanced work in Jacquard designing, being supplemented by work in the studio of the Decorative Art Department.

The course in general inorganic and organic chemistry of the first year leads to the subjects of textile chemistry and dyeing in the second year. The instruction includes a short course in the dyeing laboratory.

Power weaving commences with the second year and continues throughout the course.

During the third year the student receives instruction in the Finishing of Woolen and Worsted cloths. This instruction is given by means of lectures and laboratory work.

The instruction in the Engineering Department is carried along parallel with the other subjects of the course and includes steam, electricity and hydraulics. In the third year mill engineering is taken up and serves to show the application of the principles studied in the previous years. Mechanical drawing extends throughout all three years and finds extensive application in the machine departments.

For detail description of the subjects see page 100.

COURSE III.—TEXTILE DESIGN

FIRST YEAR

(*For First Term see page 89*)

SECOND TERM

	Hours of Exercise		Hours of Exercise
Textile Design, Cloth Analysis	135	Mathematics	30
Hand Loom Weaving	37	Textile Chemistry	15
Elements of Mechanism	45	Mechanical Drawing	60
Elementary Organic Chemistry	60	Cotton Yarn Manufacture	68
Freehand Drawing and		French	30
Decorative Art	15	English	15

SECOND YEAR

FIRST TERM

Textile Design, Cloth Analysis	202	Decorative Art	30
Machine Drawing	38	Power Loom Weaving	30
Textile Chemistry and Dyeing	30	Cotton Yarn Manufacture	75
Mechanical Engineering	30	Physics	30
Weaving Mechanism	30	Industrial History	15

SECOND TERM

Textile Design, Cloth Analysis	158	Woolen Spinning	120
Mechanical Engineering	30	Power Loom Weaving	52
Textile Chemistry and Dyeing	52	Physics	15
Industrial History	15	Decorative Art	38
Electrical Engineering	30		

THIRD YEAR

FIRST TERM

Textile Design, Cloth Analysis	218	Finishing	75
Power Loom Weaving	37	Decorative Art	38
Worsted Spinning	97	Electrical Engineering	15
Mill Engineering	30		

SECOND TERM

Textile Design, Cloth Analysis	188	Mill Engineering	45
Power Loom Weaving	97	Finishing	75
Decorative Art	38	Worsted Spinning	68
Thesis			

COURSE IV.—CHEMISTRY AND DYEING

The regular course in Chemistry and Dyeing is especially recommended to those who intend to enter upon any branch of textile coloring, bleaching, or the manufacture or sale of the various dyestuffs and chemicals used in the textile industry. The theory and practice of all branches of dyeing, printing, bleaching, scouring, etc., are taught by lecture work supplemented with a large amount of laboratory work.

During the first year general chemistry, including both inorganic and organic, is taught by lectures and laboratory work, and this is supplemented during the second term by qualitative analysis and stoichiometry. The lectures upon textile chemistry also begin during the first year.

Advanced inorganic as well as advanced organic chemistry are studied throughout the second year as a continuation of the elementary chemistry of the first year, but the greater part of the time is spent upon quantitative analysis, industrial chemistry and textile chemistry and dyeing.

The third year is devoted to advanced textile chemistry and dyeing, dye testing, dye matching, woolen and worsted finishing, calico printing and cotton finishing, quantitative analysis, industrial chemistry, physical chemistry and thesis work.

The work is taken up in a thorough manner and has been so arranged that the amount of time spent in the laboratories and in class-room work balance each other. Sufficient studies are taken in the other departments to broaden the knowledge of the student in regard to textile work in general, and he is given such training as the time will permit in mathematics, mechanical drawing, modern languages and designing.

The student who conscientiously performs all of the prescribed laboratory work and the practice work should be proficient not only in dyeing and textile printing, but should be well trained in the methods of analysis and the testing of the various chemicals, mordants and dyestuffs so extensively used in the textile industry.

For detail description of the subjects see page 100.

COURSE IV.—CHEMISTRY AND DYEING

FIRST YEAR

(For First Term see page 89)

SECOND TERM

	Hours of Exercise		Hours of Exercise
Elementary Inorganic Chemistry	30	Elements of Mechanism	45
Elementary Organic Chemistry	30	Mathematics	30
Textile Chemistry	15	Mechanical Drawing	30
Stoichiometry	30	German	30
Qualitative Analysis	225	English	15
Cloth Analysis	30		

SECOND YEAR

FIRST TERM

Advanced Organic Chemistry	30	Steam Engineering	30
Advanced Inorganic Chemistry	45	Quantitative Analysis	150
Industrial Chemistry	75	Power Loom Weaving	23
Textile Chemistry and Dyeing	30	Physics	30
Dyeing Laboratory	82	Industrial History	15

OPTIONS

Power Loom Weaving	Advanced Mathematics
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SECOND TERM

Advanced Organic Chemistry	30	Steam Engineering	30
Advanced Inorganic Chemistry	30	Dyeing Laboratory	232
Textile Chemistry and Dyeing	15	Electricity	45
Quantitative Analysis	113	Industrial History	15

THIRD YEAR

FIRST TERM

Industrial Chemistry	30	Physical Chemistry	30
Advanced Textile Chemistry and Dyeing	30	Quantitative Analysis	165
Dyeing Laboratory	225	Woolen and Worsted Finishing	30

SECOND TERM

Industrial Chemistry	30	Woolen and Worsted Finishing	68
Physical Chemistry	15	Calico Printing and Cotton Finishing	45
Advanced Textile Chemistry and Dyeing	15	Thesis	125
Dye Testing and Color Matching	45	Industrial Analysis	25
Quantitative Analysis	127	Engineering Chemistry	15

COURSE VI.—TEXTILE ENGINEERING

The course in Textile Engineering is planned to train the student to meet intelligently the engineering problems of the textile industry as well as to provide him with the essentials of the processes and machines in the varied branches of this industry.

The student is first thoroughly grounded in the broad fundamental principles of science and mathematics underlying all engineering work and textile manufacturing with its many closely allied industries. The most important of the preliminary subjects are mathematics, physics, mechanics and mechanism, and mechanical drawing. The work in mechanism and drawing is particularly thorough and the practical uses of these subjects are considered of first importance. The study of physics while taking up the usual branches included in this subject is given with special reference to problems involved in the physical testing of fibres, yarns and fabrics, etc. The student is required to spend a portion of his time during the course upon the subjects of cotton yarns, woolen and worsted yarns, and power weaving with practical work in each branch. During his first year he has a brief course in the elements of design, and in his second year he pursues a course in textile chemistry and dyeing which is preceded in the first year by the necessary preliminary course in elementary organic and inorganic chemistry. Special importance is attached to the study of power generation, transmission, and measurement and courses with laboratory practice are given in the elements of steam, electrical and hydraulic engineering, to familiarize the student with the means, methods and results available in the modern practice of these branches.

The recently equipped engineering laboratory together with the extensive power plant of the school affords opportunities for a varied line of experimental work including boiler, engine, turbine, generator and pump tests. Systematic instruction in the most approved methods of machine shop practice is provided in the shop which is fully equipped with the best makes of modern tools. This feature of the course is considered a most valuable adjunct to the training of a textile engineer.

The work in mill engineering covers a wide range of subjects including mill construction with calculations and drawings, mill heating, lighting, fire protection, electric driving, etc., The arrangement of plants and machinery for the most economical power distribution and efficient "organization" is also taken up in detail, data for problems being taken from actual cases and the solutions compared with those of some of our best known mill engineers.

For detail description of the subject see page 100.

COURSE VI.—TEXTILE ENGINEERING

FIRST YEAR

(For First Term see page 89)

SECOND TERM

	Hours of Exercise		Hours of Exercise
Mathematics	45	Cloth Analysis	30
Machine Drawing	75	Cotton Yarn Manufacture	68
Elements of Mechanism	45	Graphic Statics	45
Elementary Organic Chemistry	60	Mechanical Laboratory	37
Textile Chemistry	15	German	30
Designing (Elements)	30	English	15

SECOND YEAR

FIRST TERM

Mathematics	45	Mechanical Laboratory	38
Machine Drawing	75	Cotton Yarn Manufacture	112
Steam Engineering	30	Physics	30
Power Loom Weaving	30	Industrial History	15
Weaving Mechanism	30	Machine Shop Practice	75
Textile Chemistry and Dyeing	30		

SECOND TERM

Mathematics	45	Electricity	30
Machine Drawing	38	Physics	15
Steam and Hydraulics	30	Woolen Spinning	120
Physical Laboratory	22	Thermodynamics	15
Power Loom Weaving	30	Industrial History	15
Machine Shop Practice	60	Textile Chemistry and Dyeing	15
Mechanical Laboratory	75		

THIRD YEAR

FIRST TERM

Worsted Spinning	120	Mechanical Laboratory	37
Differential, Integral Calculus	45	Electrical Engineering	68
Mill Engineering	83	Machine Shop Practice	60
Woolen and Worsted Finishing	30	Power Weaving	37
Cotton Finishing	30		

SECOND TERM

Worsted Spinning	68	Mill Engineering Drawing	67
Mathematics	45	Power Plants	15
Mill Engineering	45	Electrical Laboratory	67
Machine Shop Practice	60	Mechanical Laboratory	30
Woolen and Worsted Finishing	53	Thesis	45
Cotton Finishing	15		

OUTLINE OF INSTRUCTION

COTTON DEPARTMENT

Cotton Fibre

- Development of Cotton Spinning Machinery.
- Botanical Varieties—Their Classification and Characteristics.
- Commercial Varieties—Classifications, Characteristics and Adaptatives.
- Microscopical Examination of Various Cottons.
- Points Considered in judging Cotton—Dampness, Color, Uniformity, etc.
- Grading and Stapling—American, Egyptian and Sea Island Cottons.
- Methods of Cultivation and Marketing.
- Ginning—Construction, Operation and Advantages of Saw and Roller Gins.
- Baling—Various forms of Baling Presses and their Products, Characteristics of each.
- Mixing—Object and Methods of Mixing for Per cent., Grade, Variety and Color Mixtures.
- Classification of the Processes of Yarn Manufacture.

Opening and Picking

- Construction and Operation of various machines used in opening and picking, cotton, Hopper Bale Breaker, Opener, Automatic Feeder, Breaker, Intermediate and Finisher Pickers, Waste Openers and Cleaning Machines.
- Details of Construction—Cleaning Trunks, Evener Motions, Types of Beaters, Grids and Screens, Lap Measuring Motion, Safety Stop Motion.
- Details of Operation—Regulation of the Air Current, Character and Regulation of the Waste, Drafts of Intermediate and Finisher.
- Adjustment of Feeder, Grid Bars, Lap Racks and Feed Rolls.
- Causes of and Remedies for—Uneven laps, Split laps, Ragged selvages, Dirty laps etc.
- Cleaning and Oiling.

Carding

- Object and Principles of Carding.
- Construction and Operation of Revolving Flat, Wellman, Foss & Peevey and Roller and Clearer Cards.
- Details of Construction—Feed Plate and Rolls, Screens, Flats, Doffer, Combs, Coiler, Mote-knife, etc.

Card Clothing—Various forms of Foundation, Wire, Method of setting, Number of Points per square foot, Shape and Size of Wire, Methods of Grinding, Method of Cutting: Tape and Clothing Cylinder, Doffer and Flats.

Details of Operation—Method of driving various parts, Stripping, Grinding and Burnishing, Setting of various parts, Draft, Speeds and Production, Temperature and Humidity.

Care of Carding Machinery, defects in quality of work and remedies for same.

Character and Regulation of waste.

Sample Carding by hand of a least twelve different blends.

Drawing

Theory of Drawing.

Effect of the Doublings.

Construction and Operation of the Drawing Frame.

Details of Stop Motions, Mechanical and Electrical and advantages of each.

Details of Drawing Rolls, Solid and Shell, Common and Metallic.

Metallic Rolls—Construction, Operation and Advantages.

Roll Covering—Materials used, Roller Cloth, Selection of leather for various kinds of work, methods of applying leather covering.

Roller Varnish—Its object and methods of applying, recipes for same.

Roll weighting for Common and Metallic Rolls.

Setting of Drawing Rolls for Long and Short Staple, Heavy and Light Slivers, etc.

Minor Details—Clearers, Traverse Motion, Weight Relieving Motion, Trumpets and Condensing.

Amount and proportioning of drafts and tension.

Construction and Operation of Railway Head.

Details of Evener Motion, Stop Motions, etc.

Care of Drawing Machinery, Roller scouring, Cleaning and Oiling, Sizing of sliver, cut sliver and remedies for same.

Roving Processes

Reeling, Weighing and Numbering of Roving by English and Metric Systems.

The Development of the Fly Frame.

Details of Construction of Slubber, Intermediate, Fine and Jack Fly Frames.

Details of the regulation of Draft, Twist, Lay and Tension on fly frames.

Amount of Twist for various cottons and methods of obtaining same.

Builder Motions—English and American types and method of setting and adjusting.

Proportioning and amounts of draft and roller setting.
Creeling, Piercing, Doffing, Cleaning and Oiling.
Stop Motions—Full bobbin. Safety stop, Back Stop motion, Single
Roving Stop Motion.
Details of Winding and Regulation of the Tension.
Study of the Differential Motion and its work in the Fly Frame.
Study of the Functions and Development of the Fly Frame Cones.
Defects in adjustment and product of roving machinery and remedies
for same.

Ring Spinning and Twisting

Theory of Spinning.
Classification of yarns in regard to uses, Materials, varieties and
Twist.
Reeling, Weighing and Numbering of single and ply yarns.
Construction and Operation of the Ring Frame.
Consideration of Spinning details, thread guides, separators, traveller
cleaners, warp and filling bobbins, space of spindles, drum and
bands, roving traverse, etc.
Rolls and roll setting, weighting, single and double boss, amount and
proportioning of draft for various yarns.
Twist and twist gearing, Amounts for warp, filling and hosiery yarns,
ply yarns, etc.
Rings and Travellers, Kinds and methods of determining correct size
for various yarns.
Comparison of Single and Double Roving in Spinning.
A Study of the development of the modern Spindle.
The Spinning Builder—Study of the Warp Filling and Combination
Builder Mechanisms.
Calculations for Speed, Draft, Twist, etc.
Methods of preparing yarn for Twisting.
The Spooler and Multiple Winder.
Operation of Ring and Flyer Twisters.
A Study of the Wet and Dry Twisting Processes.
Care of the rolls, spindles, bands, doffing.
Uneven, cut and cockled yarns and remedies for same.

Combing

Object of combing.
Kinds of cotton combed and classes of goods requiring combed yarns.
Preparing cotton for Combing, Drawing frame, Sliver lapper, Ribbon
Machine.
Combinations of preparatory machines and details of operation.

A study of the Heilmann Comber and its operation, Feed Motion, Nippers, Cylinders, Detaching Mechanisms, Draw-box, Draft, Waste and Production, Single and Double Nip Machines.

Setting and Timing the Comber, Regulation of Waste and Production, Weight of lap, etc.

A Study of the Alsation Comber and its Operation.

A Study of the Nasmith Comber and its Operation.

Care and management of combing Machinery.

Mule Spinning

A Comparison of Throstle, Ring and Mule Spinning and the Products of each Machine.

Advantages and Disadvantages of each machine.

Construction and Operation of the Self Acting Mule.

Details of Operation, Drawing and Twisting, Backing off, Winding, Re-engaging.

Details of Construction, Builder Motion, Quadrant, Roller Motion, Nosing Motions, Jacking Motions, etc.

A Study of Building and Winding.

Calculation of Draft, Twist, Drag, Production.

Causes of and remedies for, Kinky yarn, Soft cops, Ridgy cops, Uneven chase, etc.

Organization

Methods of handling Cotton Waste, Details of the manufacture of Cotton Wadding and other Waste Products.

Details of Fine Yarn Spinning, the manufacture of Sewing Thread, Lace Yarns, Twines and Cords.

The Manufacture of Fancy Yarns, Nub, Soop, Splash, Spiral Yarns, Flake Yarns, etc.

Factory Organization for various sizes and styles of yarns, Equipment, Programs, Balance of Production, Cost of Machinery, Power, etc.

The Economic Arrangement of Cotton Machinery.

Life of Cotton Machinery, Depreciation and Valuations.

Factory Cost Systems, Inventory, Productive and Non-Productive Labor, Supplies, Maintenance, General Expenses, etc.

Knitting

The course in Knitting is designed to meet the needs of those requiring special work in this branch, as well as those desiring only a general knowledge of the subject and is given to Third Year students of courses I and II. The course begins with lectures upon the yarns used and the preliminary operations, and continues with the construction and operation of the various makes of knitting machines as applied to circular and flat knitting.

Beginning with the hand stocking frame, the student is given instruction upon the machines used for hosiery and the flat machines used in the manufacture of gloves, sweaters and jackets.

Following is a list of subjects taken up:

- Knitting yarns and Their Manufacture.
- Operations preliminary to Knitting.
- Winding—Cone Winding, The Payne Winder.
- Development of Knitting.
- Knitting Needles—Their Construction and Operation.
- Latch Needles, Spring Needles.
- Method of Producing Standard Stitches.
- Study of the Plain, Rib and Tuck Stitches and their uses.
- Circular and Flat Knitting Machines.
- Operations involved in the Manufacture of Seamless Hosiery.
- Study of the production of the Rib Top.
- Details of Construction and Operation of the Circular Rib Knitting Machine, including a consideration of Stop Motions, Needle Cams, Pattern Wheels, Splicing Attachments, Measuring Devices, etc.
- Transferring of Rib Tops.
- Details of Construction and Operation of the Seamless Hosiery machine, including a study of Stop Motions, Plating Attachments, Pattern Wheels and Chains, Shaping the Heel and Toe, Reinforcing the Heel and Toe, Loosening the Stitch for Reinforcing and Shaping, Semi, Three-quarter and Full Automatic Hosiery Machines.
- Construction of the Loper and Study of its Operation. Regulation of Tension, etc.
- Designing on Seamless Hosiery Machines—Study of the Production of Fancy Stitches, Designing by means of Colored Threads.
- Size of Yarn for Various Work and Gauges.
- Study of the Finishing of Hosiery—Washing, Dyeing, Boarding, Mending, Pressing, Pairing, Stamping, etc.
- Imperfections in Circular Knit Goods and Remedies for Same—Dropped Stitches, Curled Work, Ragged Edges, Stains, Streaked Work, etc.
- A Study of the Flat Knitting Machines—The Lamb Principle as applied to Glove and Sweater Manufacture.
- The Jacquard as applied to Flat Knitting Machinery.

WOOLEN AND WORSTED DEPARTMENT

Raw Materials

Animal Fibres—Wool, Silk, Mohair, Alpaca, Vicuna, Cashmere, Camel Hair, etc.
Vegetable Fibres—Cotton, Flax, Hemp, Jute, Ramie.
Wool Substitutes—Noil, Shoddy, Mungo, Extracts.
Waste Products manufactured on Woolen Machinery—Cotton Waste, Linters, Flax, Hemp, and Jute Waste.
Sources of supply and relative values of above.
Chemical and Physical properties and Composition.
Microscopical examination.

Wool Fibre

Physical and chemical structure—Differences between wool, hair and fur—
Physical properties, Strength, Elasticity, Curl, Lustre, etc.
Felting Property—Hygroscopic Property.
Structure and cause of Kemps.
Definitions of trade terms—Picklock, XXX, XX, 1-2 Blood, 3-8 Blood, 1-4 Blood, Delaine, Braid, etc.
Pulled Wools—Their uses and classification.

Wool Sorting

Difference between Sorting and Grading—Sorting and Blending.
Judging Spinning Qualities.
Estimating Shrinkage.
Definitions of trade terms—Cots, Hog, Shurled Hogget, Wether, Fries, Paint, Stain, Shoulder, Cast, etc.

Wool Scouring

Object of Wool Scouring.
Composition of Yolk and Suint.
Cholesterol and Lanolin.
Materials used as detergents.
Emulsion Process—Use of Soda, Potash, Hard and Soft Soaps.
Manufacture of Scouring Soaps with tests for impurities.
Water in Wool Scouring with tests for hardness, etc.
Effect of heat on Wool Fibre with proper heat of scouring liquor.
Recovery of potash salts and wool fat from waste scouring liquor.
The Solvent process—Degreasing Wool, with Naphtha.
Construction and use of Scouring Machines and Rinse Boxes with Speeds, Adjustments and Productions.

Construction and use of Dryers, Table and Artificial.
Effect of heat on Lustre; proper heat for various classes of Wool—
(Braid, Botany, Mohair, etc.).

Carbonizing

Object of Carbonizing.
Carbonizing Wool, Noils, Burr Waste, Rags, etc.
Carbonizing Agents—Sulphuric Acid, Aluminum, Chloride, etc.
Hydrometers.
Strength of Carbonizing Agents.
Carbonizing with Acid Gases.
Neutralizing.

Burr Picking

Object of Burr Picking—What wools are Burr Picked, and why
they are not carbonized.
Construction and Use of the several Kinds of Burr Pickers.
Adjustments, Speeds and Production of same.

Mixing and Oiling

Object of Mixing. Laying down lots.
Mixing Different colors of Wool.
Mixing Wool with Cotton, Shoddy, Noils, etc.
Objects of Oiling—Discussion of various Kinds of Oils used, Olive,
Lard, etc.
Oil Testing, Viscosity, Flashing Point, etc.
Manufacture of Emulsions.
Construction and Use of Automatic Oilers, Feeds and Pickers.
Speeds, Productions and Calculations for cost of Lots when materials
of different values are used.

Carding

Principles of Carding.
Functions of various parts—Feed Rolls, Lickerins, Tumblers, Work-
ers, Strippers, Cylinders, Fancies, Dickies, Doffers, etc.
Construction of various parts.
Direction of Revolution and Speeds.
Card Clothing—Construction and uses of the various Kinds of Back-
ing: Leather, Flexifort, etc.—The several Kinds of Wire—Gar-
nett, Metallic, Convex, Lickerin, etc.
The "Counts and Crown" method of counting Card Clothing.
Card Adjusting and the use of Card Sets.
Clothing the Card.
Card Grinding and Grinders, Solid Roll, Traverse, Screw and Chain.

Woolen Cards

Construction and use of the First Breaker, Second Breaker and Finisher.

Various methods of coupling Cards.

Card with Breast.

Woolen Card Feeds—Objects, Construction, and use of Automatic Feeds for First Breaker, Bramwell, etc.

The Construction and use of the several Kinds of Automatic Feeds for Second Breaker and Finisher, Apperly, Torrance Balling Head and Creel, Bates, Kemp, Scotch, etc.

Condensers, Rub Roll, Combination, Double Apron, etc.

Calculations for Proper Weight of Rovings, Speeds, Productions, etc.

SAMPLE CARDING.—Each student is required to make at least twenty Sample Mixes combining different colors and grades of Stock and to Felt and Mount the same. Part of the Carding to be done by Hand Cards and part on the Torrance Sample Mixing Card.

Woolen Mule

Principles of Spinning. History and development.

Hand Jack, Self-operating and Self-acting Mules. The Mule-head.

Methods of Driving the various parts, Rolls, Spindles, Carriages, etc. Backing-off. Winding Mechanism.

Study of the Quadrant and Builder-rail. Regulation of the Fallers.

Double Spinning. Twisting on Mule and on Woolen Twister.

With the above lectures will be given all the necessary calculations and actual practice on the various machines.

Worsted

Top Making

CARDING AND PREPARING—The principles of Worsted Carding—Types of Worsted Cards, Double Cylinder Lickerin, Breast, etc.

Speeds, Settings, Feeds, Adjustments, Productions.

PREPARING—Differences between Carding and Preparing—What Wools are Prepared and why they are not Carded. The use of Emulsions. A Set of Preparers. The calculations for Drafts on any Gill Box. The Clough Gill Box.

The proper Drafts in Preparing—Adjustments, Speeds, Productions, Calculations, etc.

GILLING AFTER CARDING—Number of Doublings, etc.

Combing

The principles, history and development of Worsted Combing.

Combing on the Noble and Lister machines.

Calculations for Draft—Settings, Speeds, Productions, etc.

Per cent of noils

GILLING AFTER COMBING—Proper Drafts and calculations for Doublings.

BACK WASHING—The object and nature of the process—Backwashing Liquors, Composition, Heat, etc.

The Hygroscopic property of Wool—Conditioning of Tops—Top Mixing.

Open Drawing or Bradford System

The Principles of Drawing. Numbers of Operations for different Counts of yarn. The use of Logarithms in Drawing Calculations, Study of the Drag—Calculations for Drafts and Twists—Proper Ratch.

The functions of the Weigh Box.

Measuring Stop Motions, Candle Stick, Side Knock-off, etc.

Calculations for length.

Construction and use of Gauge Points or Constants.

Effects of Doubling.

The Dram and Hank Systems for numbering Roving.

Cone Drawing

The object and use of Cone Drawing—Differential Motions, Builder Motions—Calculations for Draft—Twist-Tension and Lay—Adjustments, Speeds and Productions.

French Drawing

The principles and use of French Drawing—Functions of the Porcupine. The principle of Condensing—Manufacturing of Merino Yarns.

Spinning, Open or Bradford System

The Principles of Spinning. Calculations for Draft and Twist—Spinning on the Cap—Flyer and Ring Frames—The Scaife Builder Motion—Drag in Bradford System of Spinning—The use of Straight, Conical and Bell Mouthed Caps. Top Roll, Single and Double Covered, Iron and Wood.

Types of Frames, Leicester and Illingworth; Speeds, Productions, etc.

Spinning, French System

Principles of Worsted Mule Spinning, Calculations for Draft and Twist, Ratch, Drag, Backing off, Winding, Re-engaging, Size and shape of Caps, Builder Motion, Quadrant, Metric and English systems of Calculations.

Twisting

Principles of Twisting, Reeling, Weighing and Numbering of Single and Ply Yarns, Twisting on Cap, Flyer and Ring Frames—Calculations for Twist—Twist testing—Trap Twisters—Effect of direction of Twist; Speeds, Productions, Yarn Testing, etc.

The true difference between Woolen and Worsted Yarns. Layout of Machinery for different classes of Yarns—Power required for different machines—Cost of Machinery and approximate labor cost of each Department, Sorting, Scouring, Carbonizing, Picking, Carding, Combing, Drawing, Spinning, Twisting, etc., for various classes of Yarns, Carpet, Braid, Botany, etc.

DESIGNING AND POWER WEAVING DEPARTMENT

Textile Design

This course is taken by students of all manufacturing courses throughout the entire three years. Students of Courses IV and VI pursue the subject during the first year only. The instruction takes up the subjects of Classification of fabrics, use of point or design paper, plain fabrics, intersection, twills and their derivation, sateen, basket and rib weaves, checks and stripes, fancy weaves including figured and colored effects; producing chain and draw from design and vice versa; extending and extracting weaves.

The work of the second year follows with consideration of fancy and reverse twills, diaper work, damasks, skip weaves, sateen fabrics with plain ground, backed fabrics, and multiple ply fabrics. Students are required to make original designs and reproduction of analyzed samples and put the same into the loom. Special attention is given to the consideration of color effects.

The advanced work of the third year takes up the more complicated weaves adapted to harness work and leads into leno and Jacquard designs. The following is a brief list of the subject heads which will give some idea of the course: Double plain cloths, Ingrains, Tricots, Chinchilla, Tapesstry, Blankets, Upholsteries, Spot weaves, Pile or Plush, Crepon, Matelasse and its imitation, Pique, Marseilles, Quilting, Miscellaneous designs for Jacquard, Lenos, Fustian, Tissue fabrics, Lappets, etc.

The same plan is pursued during this year as in the second year, that of requiring the students to make original designs and to weave the same.

Fabric Analysis

This subject is taken by all courses during the first year, and is continued during the second and third years by Courses I, II, and III. It takes up in a systematic manner the analysis of samples illustrating the various cloth constructions for the purpose of determining the design of the weave, the amount and kind of yarns used and forms the basis of calculation in the cost of reproducing any style of goods. The various headings discussed are, Reeds and Setts, Relation and determination of counts of cotton, woolen, worsted, silk, and yarns made from the great variety of vegetable fibres. Grading of yarns, folded, ply, novelty and fancy yarns. Application of the metric system to yarn calculation. Problems involving the use of both English and Metric systems. Problems involving take-up and shrinkage, average counts, determination of counts of yarn, weight of yarn required to produce a given fabric, determining diameters of yarns. Methods of testing yarns. Question involving loom productions, mixes, blends, etc.

Practical Work

In connection with the above outlined work practical work is carried on upon the hand looms and upon the power looms. This includes the preparation of warps, beaming, dressing, sizing, drawing-in and making of chains, the cutting and lacing of cards. Spooling and quilling and the machinery for the same. A study is made of warpers, sizing machines both for cotton and woolen. Lectures are given properly timed to correspond with the progress of the student in the Power Weaving laboratory covering the following subjects:

Loom adjustments, chain building, shuttle changing looms, dobby looms, single and double acting dobbies, handkerchief motions, leno weaving, centre selvedge motions, filling changing looms, oscillating reeds, lappet motions, various shaker motions, towel and other pile cloth weaving, Jacquard looms, single and double lift leno Jacquards, Jacquards of special design, tying up Jacquard harness. The consideration of the mechanical operation and design of the special mechanisms and the calculations involved is taken up by the Engineering Department in a course of weaving mechanism for which see page 126.

Textile Costs

There has recently been organized a course of lectures and class work for the purpose of giving instruction upon the systems of determining the costs of producing textile yarns and fabrics, as well as the value of the materials at various stages in the process of manufacture. It is not the plan of this course to teach one particular system of cost finding to the

exclusion of all others but rather to give the general fundamental principles applicable in any system, to show the interrelationship of the various departments and the duties of the various officers. The list of the headings under which the instruction is given will give some idea of the ground covered.

Requirements in a cost system.

Comparison of new and old methods.

Organization of a mill and the relationship of the departments.

Administrative, Manufacturing, Commercial Division.

Distribution of expenses.

Depreciation.

Labor and its subdivisions: Day work—Piece work, etc. Premium labor, Differential labor.

Details in processes in manufacturing influencing costs.

Inventories.

Numbering or lettering processes applied to cost systems.

Material tables.

Time cards.

Weekly department cards.

Use of charts in showing comparison of costs.

Wastes, leaks.

Problems are frequently given for the purpose of illustration and to assist in fixing the principles involved clearly in mind.

DECORATIVE ART DEPARTMENT

Decorative Art. First Year

This course deals with design wholly from the aesthetic standpoint. The purpose of the course is to arouse in the student an interest and appreciation of good decoration, to stimulate his imagination and strengthen his artistic perception. For those who choose to take more advanced courses in decorative art this course is directly preparatory.

First Term. Lettering and Color

The course is conducted through lectures and class work. The aim is to give an understanding of the principles which govern the proportion and delineation of simple types of letters, in spacing and in the arrangement of the sheet. The engineer's alphabet is studied in particular and the students find this of immediate value in other courses.

The second period of the first term is devoted to color. Realizing the importance of color in textile manufacturing, this subject is given careful consideration. The course is designed first, to give the student a precise vocabulary and a clear understanding of the modifications of pure color; second, to give him a working knowledge of color as related to the mixture of pigments and yarns. Plates are given on the following subjects: Nomenclature, Mixture of pigments, Properties of individual colors, values,

intensities, Influence of contiguous tones, Harmony of colors, values, intensities. The desk work is planned to train the eye and illustrate the principles taught in the lectures as well as to give the student practical experience in the mixture of pigments, matching of colors, and arrangement of tone harmonies.

Second Term. Pure Design. Design in Representation

The second term deals with pure design and design in representation. First the principles of order in design are studied, then the principles which govern the conventionalization of nature in ornament. The course is conducted through lectures and plates illustrative of these lectures. The principles of order are illustrated with lectures and by original work by the students. The principles of conventionalization are taught by freehand drawing from examples of the best styles in historic ornament.

Second Year Decorative Art for Course III

The work of this course is more advanced and specific. The first term is devoted almost entirely to freehand drawing from plates, objects, textiles, etc. Lectures are given on decorative use of weaves, characteristics of certain classes of goods, on planning of ornament and repeats. The second term is devoted to original designing and enlargement to point paper.

Third Year Decorative Art for Course III

This course is a continuation of the second year work. As the student becomes more proficient, he is given more advanced work and he undertakes designs for damasks, brocades, tapestries, carpets, etc., to be finished on point paper and transferred to the loom.

Decorative Art for Special Students

This course is planned to give a student a working knowledge and appreciation of design. The first and second years are devoted to a general study of design, color, perspective, lettering and rendering. Drawings are made in the Historic styles for all materials—wood, gold, silver, copper, brass, leather, fabrics, wall papers, and glass.

In the third year students should specialize and devote their attention to the material in which they expect to work. Thus a student may make a special study of jewelry, gold and silver ware, brass and bronze work, fabrics, wall papers, furniture, interior finish, or stained glass, etc.

CHEMISTRY AND DYEING DEPARTMENT

Elementary Chemistry

This subject is required not only of the students taking the regular course in Chemistry and Dyeing, but by all others intending to take a complete course and receive the school diploma.

It extends through one entire year and includes lectures, recitations, and a large amount of individual laboratory work upon the following subjects:

Chemical Philosophy

Chemical action, chemical combination, combining weights, atomic weights, chemical equations, acids, bases, salts, Avogadro's law, molecular weights, formulas, valence, periodic law, etc.

Non-Metallic Elements

Study of their occurrence, properties, preparation, chemical compounds, etc.

Metallic Elements

Study of their occurrence, properties, metallurgy, chemical compounds, etc.

The Hydrocarbons and their Derivatives

Study of their occurrence, properties, preparation, uses, etc. This work although elementary in character is of sufficient breadth to prepare the student understandingly for the work with the artificial dyestuffs which follows.

Quantitative Analysis

Before the completion of the course, the student takes up as thoroughly as the time will permit, the qualitative detection of the more common metals and non-metals, with practical work.

Qualitative Analysis

Qualitative Analysis is studied by all regular students in Course IV during the second term of the first year. The work is based upon Prescott and Johnson's Qualitative Chemical Analysis and consists of one lecture, one recitation, and not less than twelve hours laboratory work per week. The student must become familiar with the separations and the detections of the common metals and acids by the analysis of a satisfactory number of solutions, salts, alloys, pigments, etc. At intervals during the term, short laboratory tests are given as well as the regular written examinations.

No pains are spared to make the course as valuable to the student as possible and to encourage only thorough and intelligent work.

When sufficiently advanced, students take up the examination of various products with which the textile chemist must be familiar, such as testing mordanted cloths, pigments, and the various dyeing reagents.

During the latter part of this course a certain amount of time is devoted to the preliminary operations of Quantitative Analysis, such as

the precipitation and washing of such substances as barium sulphate, magnesium ammonium phosphate, calcium oxalate, etc., although no weighings or actual determinations are made.

A student's marks in this subject depend as much upon the neatness and care used in manipulation as upon the actual results obtained.

Stoichiometry

This subject is taken up by the Chemistry and Dyeing student during the second half of the first year.

The application of the metric system is thoroughly studied, and problems are worked involving the expansion and contraction of gases, determination of empirical formulae, combining volume of gases, quantitative analysis, etc.

Advanced Inorganic Chemistry

The whole subject of Inorganic Chemistry is reviewed during the second year, and many advanced topics are introduced which were necessarily omitted from the first year course in General Chemistry.

Advanced Organic Chemistry

The course consists of lectures and recitations extending through the second year. The principles of organic substitution and synthesis are thoroughly discussed using as many illustrations as the time will permit, particularly such as are applied in the arts. The aliphatic series of hydrocarbons and their derivatives are studied for about twenty weeks of the year, the remainder of the time being devoted to the benzene series. The aim of the course is to lay a broad foundation for the chemistry of the artificial dyestuffs, which is studied in the third year. Students are required to work out problems in the synthesis of various compounds in order to get familiarized with equation writing.

Physical Chemistry

This subject is studied during the third year.

It includes the principles of calorimetry, specific heat, vapor density, the various methods of determining molecular weights, laws of solution, electrolytic dissociation, theories of precipitation, thermo-chemistry, surface tension, etc. The student is required to work out a large number of problems introduced by the subject.

Quantitative Analysis

This subject is taken up by all regular Chemistry and Dyeing students and extends through the second and third years of the course.

During the second year, the principles of analytical work are thoroughly taught, the work being based on Talbot's Quantitative Chemical

Analysis, Gravimetric analysis is studied during the first term, and volumetric analysis during the second term. The samples analyzed include salts, ores, minerals, bleaching powder and alkalies. Frequent recitations are held for the discussion of methods and the solution of stoichiometrical problems. Students are encouraged to read the standard works and magazines on chemical subjects, in order to cultivate broad views of the science.

The third year work involves chiefly technical analysis, the principal consideration being the analysis of water, alum, ammonia, soaps, coal, indigo, tannin, and the ultimate analysis of organic compounds, as well as the examination of acids, alkalies, oils, scouring materials and such substances as starches, gums, and other thickeners, detection of adulterants, etc.

No pains are spared to give the students the benefits of all the latest researches along the lines of industrial analytical methods, and original work is encouraged in all.

Textile Chemistry and Dyeing

Under this head is included first, the lecture course in Textile Chemistry and Dyeing, which is taken by all regular diploma students; second, the general laboratory course taken by all regular diploma students, except those taking Course IV, and the laboratory and practical work course which is taken by the regular Chemistry and Dyeing students.

OUTLINE OF LECTURE COURSE

Technology of Vegetable Fibres

Cotton, Linen, Jute, Hemp, China Grass, etc. Chemical and physical properties, chemical composition, microscopical study, and their action with chemicals, acids, alkalies, heat, etc.

Technology of Animal Fibres

Wool, Mohair, Silk, etc. Chemical and physical properties, chemical composition, microscopical study, and their action with chemicals, acids, alkalies, heat, etc.

Technology of Artificial Fibres

Study of the various forms of artificial silk, the process of manufacture, their properties and action with chemicals, acids, heat, etc.

Operations Preliminary to Dyeing

Bleaching of cotton and linen, wool scouring, bleaching, fulling and felting of wool, carbonizing, silk scouring and bleaching, action of soap.

The bleaching of cotton cloth, yarn and raw stock is studied at length with detailed descriptions of the various forms of kiers and machinery used; also the action of the chemicals used upon the material and the various precautions that must be taken in order to insure successful work.

Under this heading is also included an exhaustive study of the reagents used in emulsive wool scouring process and their action upon the fibre under various conditions; also the most successful of the solvent methods for degreasing wool.

Water and its Application in the Textile Industry

Impurities present, methods for detection, their effect during the different operations of bleaching, scouring, dyeing and printing, and the methods for their removal or correction.

The important subject of boiler waters is also studied under this heading with a full discussion of the formation of boiler scale, its disastrous results and the methods by which it may be prevented.

Mordants and Other Chemical Compounds used in Textile Coloring not Classified as Dyestuffs

Theory of mordants, their chemical properties and their application, aluminum mordants, iron mordants, tin mordants, chromium mordants, organic mordants, tannin materials, soluble oil, fixing agents, levelling agents, assistants, and numerous other compounds not dyestuffs that are extensively used in the textile industry.

Under this heading is included the definitions of various terms and classes of compounds, used by textile colorists, such as color lakes, pigments, fixing agents, developing agents, mordanting assistants mordanting principles, levelling agents, etc.

Theory of Dyeing

A discussion of the chemical, mechanical, solution and absorption theories, and the various views that have been advanced by different investigators of the chemistry and physics of textile coloring processes.

Under this heading is discussed the general methods of classifying dyestuffs and definitions of such terms as textile coloring dyeing, textile printing, substantive and adjective dyestuffs, monogenetic and polygenetic dyestuffs, etc.

Natural Coloring Matters

Organic, properties, an application of indigo, logwood, catechu or cutch, Brazil wood, cochineal, fustic, tumeric, madder, quercitron bark, Persian berries, and other natural dyestuffs that have been used within recent years by textile colorists.

Mineral Coloring Matters

Under this heading are discussed the properties of such inorganic coloring matters and pigments as chrome yellow, orange and green, Prussian blue, manganese brown, iron buff, etc.

Artificial Coloring Matters

General discussion of their history, nature, source, methods of manufacture, methods of classification, and their application to all fibres.

Special study of:—

Basic Coloring Matters.

Phthalic Anhydride Colors, including the eosins, phloxines, etc.

Acid Dyestuffs.

Janus Colors.

Direct Cotton Colors.

Sulphur Colors.

Mordant Colors, including the alizarines and other artificial coloring matters requiring metallic mordants.

Mordant Acid-Colors.

Insoluble Azo Colors, developed on the fibre.

Reduction Vat Colors, including Artificial Indigo, Indanthrene, Flavanthrene, Viridanthrene and Melanthrene.

Aniline Black and other artificial dyestuffs not coming under the above heads.

As each class of dyestuffs is taken up, the detail of the methods of applying them upon all the different classes of fabrics and in all the different forms of dyeing machines are thoroughly discussed; also the difficulties which may arise in their application, and the methods adopted for overcoming them.

Machinery used in Dyeing

A certain amount of time is devoted to the description of the machinery used in the various processes of textile coloring, which is supplemented as far as possible by the use of charts, diagrams, lantern slides, etc.

Most of the important types of dyeing machines are installed within the dyehouse of the School and the students can be taken directly from the lecture room and shown the machines in actual operation.

Outline of Laboratory and Practical Work

Besides lectures and recitations upon this subject, those taking the regular day course in Chemistry and Dyeing are required to do at least fifteen hours per week of practical laboratory work. By the performance

of careful and systematic experiments the student learns the nature of the various dyestuffs and mordants, their coloring properties, their action under various circumstances and the conditions under which they give the best results. The more representative dyestuffs of each class are applied to cotton, wool and silk, and each student is obliged to enter in an especially arranged sample book, a specimen of each of his dye trials with full particulars as to the conditions of experiment, percentage of compounds used, time, temperature of dye bath, etc.

For convenience and economy most of the dye trials are made upon small skeins or swatches of the required material, but from time to time students are required to dye larger quantities, in the full sized dyeing machines which are described elsewhere.

By the use of a small printing machine the principles of calico printing are illustrated, and by means of the full sized dyeing machines, vats, etc., the practical side of the subject is studied. It is the constant endeavor of those in charge, to impart such information of a theoretical and scientific character as will be of value in the operation of a dyehouse.

Advanced Textile Chemistry and Dyeing

This is a continuation of the Textile Chemistry and Dyeing of the second year and includes a review of the second year's work in this subject, with the introduction of many advanced considerations, and in addition the following subjects:—

Classification and Construction of Artificial Dyestuffs

A study from a more advanced standpoint of the classification and constitution of artificial dyestuffs, including the various methods used in their production, also the orientation of the various groups which are characteristic of these compounds, and their effect on the tinctorial power of dyestuffs.

The object of this study is to give the student a more complete knowledge of the artificial dyestuffs from the color manufacturer's point of view, and it will prove of particular value to those who intend later to enter the employ of dyestuff manufacturers or dealers.

This subject cannot be taken by students who have not completed the second year course in Organic Chemistry.

Color Matching and Color Combining

A study of that portion of physics which deals with color, and of the many color phenomena of interest to the textile colorist, the lecture work being supplemented with the practical application of the spectroscope and tintometer, and much practice in the matching of dyed samples of textile material.

The primary colors both of the scientist and textile colorist and the results of combining colored lights and pigments, and such subjects as color perception, color contrast, purity of color, luminosity, hue, color blindness, dichroism, fluorescence, and the effect of different kinds upon dyed fabrics are discussed under this heading.

Each student's eyes are tested for color blindness early in the course in order that he may be given an opportunity to change his course if his eyes should prove defective enough to interfere with his work as a textile colorist.

A dark room has been provided where various experiments in color work and color matching may be performed.

Dye Testing

This subject includes the testing of several dyestuffs of each class, to all the common color destroying agencies, the determination of their characteristic properties and their action towards the different fibres. Also the determination of the actual money value and coloring power of dyestuffs in terms of a known standard.

Each student is required to make a record of each color tested upon an especially prepared card which furnishes a permanent record of the dyestuffs, its dyeing properties, fastness to light and weather, washing, soaping, fulling, perspiration, bleaching, steaming, ironing, rubbing, acids and alkalis.

Union Dyeing

A study of the principles involved in the dyeing of cotton and wool, cotton and silk, and silk and wool union materials with the production of solid and two color effects.

Textile Printing

A thorough study of the whole subject of textile printing, each student being required to individually produce no less than twenty different prints including the following styles:— Pigment style, direct printing style, steam style with tanning mordant, steam style with metallic mordant, madder or dyed style, the ingrain or developed azo style, discharge dyed style, discharge mordanted style, resist style, indigo printing, aniline black printing.

The different parts of the calico printing machine are thoroughly studied, the precautions which must be considered in its use and the arrangement of the dyeing apparatus which must accompany such a machine.

Special attention is paid to the methods of mixing and preparing the various color printing pastes that are used in the above work upon the manufacturing scale as well as experimentally in the laboratory.

Cotton Finishing

A study of the various processes of finishing cotton cloth and the different materials used therein. The work involves the discussion of the various objects of cotton finishing and such operations as pasting, damping, calendering, stretching, stiffening and filling, and the various machines used for carrying out these processes.

Mill Visits

During the third year, visits are made to some of the large dyehouses, bleacheries and printworks in the vicinity.

Industrial Chemistry

Special attention has been given to this subject because it is considered extremely important in the study of chemistry in general, and of textile chemistry in particular. During the second year considerable time is spent in the laboratory in the actual manufacture, from raw materials, of the chemical compounds used in textile work. Each student is required to make careful record of all of the crude materials used, as starting points, and to carry the various processes through as carefully as possible with the view of producing as great and pure a yield of each substance as possible. Industrial Chemistry not only involves the application of the principles of both inorganic and organic chemistry, but of analytical work as well, for the purity of the compounds produced must be tested after their manufacture.

In addition to the general work in this subject, each student is required to make a special study of the manufacture of some chemical from raw materials in considerable quantity (20 to 25 pounds) making a complete quantitative analysis of all the raw materials used and of the finished product, accounting for everything throughout the process with the object of producing as near the theoretical yield as possible. The student is charged with amount of raw material at market prices, and the finished product is bought back by the school.

During the past year extensive construction work and much new apparatus has been added to the industrial chemistry laboratory and it is now believed to be one of the most complete of its kind. The present equipment allows of a comparatively large quantity of materials being handled at one time.

During the whole of the third year, lectures and recitations are held in Industrial Chemistry, the course in general following "Thorpe's Outline of Industrial Chemistry." Particular attention is paid to those subjects which are of special interests to the textile chemist, as oils, soaps, gas and coal tar industry, building materials and the manufacture on a large scale of important chemical compounds, such as the common acids and alkalies, bleaching powder, various mordants, etc. The course is illustrated as far as possible with specimens, diagrams and charts, and the students are given an opportunity to visit some of the industrial establishments in the vicinity of Lowell and Boston.

Engineering Chemistry

During the second term of the third year a series of lectures are given upon the general subject of Engineering Chemistry, which include particularly the consideration of fuels, oils, and water from the chemical engineer's standpoint. The elements of Chemical Engineering are also considered to such an extent as time will permit.

In conjunction with this course there is required a specified amount of laboratory work in the Industrial Analysis Laboratory which has been recently thoroughly equipped with the latest and best apparatus for fuel and oil analysis.

Microscopy

The value of the microscope in the detection and examination of the various fibres cannot be over-estimated, and often facts may be discovered, and conclusions drawn, which could be arrived at in no other way.

The students in this course are given as much work with the microscope as time will permit. They receive instruction in the use of the high grade microscopes, and not only have practice in the examination and detection of the fibres, but are required to become proficient in the preparation of permanent slides.

Opportunity is also given for students to take microphotographs of fibres and the various slides which they may prepare. A special dark room has been provided for this purpose.

FINISHING DEPARTMENT

Woolen and Worsted Fabrics

Burling and Mending

Under this head is taken up for consideration the examination of flannel as it comes from the loom, the construction, use, and location of the perch, the methods used in marking defects, measuring, weighing, and numbering of cloths, also the methods of inspection for fancies, single cloths, double cloths, etc. The object of burling, mending,

and the types of tables employed, the method of removing knots, runners, etc., the object of back shearing and the use of burling irons, the replacing of missing threads and the importance of sewing as a part of the finishing process, are all considered in detail. The removal of oil and tar spots as well as stains of various kinds is studied.

Fulling

This branch covers a study of the condition of the flannel as it comes from the loom, the influence of oil, size, etc. upon the procedure. Considerable time is devoted to the various methods of producing a felt, the early types of stocks, hammer falling, crank stocks, etc., and their modifications and development into the present type of rotary fulling mills of both the single and double variety. The details of construction in all machines are carefully taken up and include the design and composition of the main rolls, methods of covering, regulation and means of adjusting the pressures of traps and rolls, consideration of the shoes, the use and regulation of the various types of stop motions, the different types of stretchers, guide rolls, and throat plates.

The theory of felt is taken up and the influence of pressure, moisture, heat, alkali, and acid is considered as well as the hydroscopic and felting properties of different wool fibres. The preparation of the flannel for the mill and the usual methods of determining shrinkages as well as the various methods of soaping obtain careful attention. The preparation of various fulling soaps and the value of each for the production of various degrees of felt as well as the determination of the proper amount of alkali for various goods are carefully studied and demonstrated. The manipulation of the various kinds of goods in the mill, viz: all wool, shoddies, and mixed goods is studied in class room and by operation in the mill.

The changes in weight and strength for each operation are carefully considered as well as the value of the flocks made in each. A study of the various methods of flocking, such as dry and wet are considered in both class and machine rooms. In each operation the defects likely to materialize are studied as well as the causes thereof, and various methods of modifying or lessening them.

Washing and Speck Dyeing

This branch considers the scouring, rinsing and washing of goods both before and after the fulling process. The various types of washers and the details of construction, such as suds, box, rolls, etc. The theory of scouring, uses of Fuller's earth, salt solutions, and sours, on the different kinds of goods is made clear by practical work in the

machine room, where the defects due to improper scouring such as stains, cloudy effects, wrinkles, unclean goods, etc., are demonstrated. The discussion of the necessity of speck dyeing follows naturally from the study of these matters and includes methods of preparation, materials used, application and tests required.

Carbonizing

This is an important branch of finishing and includes a study of the various carbonizing agents, methods of application, strength of solutions, neutralizing, etc., as well as the machines used. Stains and imperfections resulting from carbonizing are also considered. The drying and tentering machines and extractors employed are taken up at this point.

Gigging, Napping and Steaming

The construction in detail of the various types of gigs, nappers, steamers, wet gigs, rolling, stretching, crabbing and singeing machines is discussed and their actions upon the cloth and the results obtained are explained.

Various methods of obtaining lustre and the production of permanent finish are considered in connection with steaming and sponging.

Brushing, Shearing and Pressing

This includes as do the other branches a careful treatment of the machines employed, the preparation of the cloth for each process, the action of each machine in producing its part of the resultant effect. With the manipulation of the shear comes the matters of setting, grinding, and adjustment. With the brushing machine the effect of steaming and moisture upon the lustre and "feel" of the goods is shown. A study of the action of the presses both plate and rotary involves consideration of pressure, steaming, etc. Special processes to obtain particular effects are taken up and the part played by each machine is explained. The details involved in handling cloth on a commercial scale as for example measuring, weighing, ticketing, numbering, rolling, etc., are also explained. The necessary calculations and the methods of finishing all grades of goods are considered from time to time during the year.

Cotton Fabrics

Cloth Room

Inspection of the various goods and the object thereof. Construction of the various types of inspecting and trimming machines.

Shearing

The object. A consideration of the various types of shears for treating one or both sides at the same time, also the use of the usual cleaning devices such as, emery, sand, and card rolls, beaters, brushes, etc. Grinding and the adjustment of the various parts.

The use of brushing and cleaning machines, rolling devices, and calender attachments, for grey goods.

Singeing

Development and object of singeing. The construction of singers of all types, and for various purposes. The use of cooling tanks, steaming devices, rolling and brushing attachments.

Regulation of the flame for various goods and adjustment of the parts. Gas and air pressures, water cooled rolls. The effect of moisture on the cost of singeing, etc. The use of dry cans in connection with singeing. Electric singeing.

Washing

Open width and string washers. Their construction and operation. Soaps, Temperature, Squeeze rolls, etc. Washing of various goods and the object thereof. Stains.

Napping

The object of napping and the usual method of treating goods. Various types of nappers—Single—Double acting—Felting nappers, Construction, Grinding, and adjustment of various types.

Water Mangles

Their object and the construction of various types. Various rolls, iron, husk, etc. Scutchers, their object and construction.

Starch Mangles

The object and construction of all types of starch mangles for pure starch and filled goods. Various types of rolls, brass, rubber, wood. Action of doctor blades, etc. Regulation and object of pressure.

Methods of starching and finishing all standard goods, also a consideration of the various substances used, such as starch, softener, fillers, etc. The preparation of starch and various methods of application.

Dryers and Stretchers

Both horizontal and vertical, Tenter frames, Clips. The swing motion and the finishes thus produced. Construction. Spraying machines, belt stretchers, button breakers. Their object, construction.

Calenders

The object and construction of all types, including the regulation of pressure and nips for the production of various finishes. Various types of rolls and their use, steel, husk, and paper, etc. The use of hot and cold rolls. Chasing, friction, embossing and Schrier calenders, and the various finishes produced by each. Production of watered effects. Beetling machines.

Making up room—Yarding, Inspecting. Different types of folds. Pressing, papering, marking.

TEXTILE ENGINEERING DEPARTMENT

Elements of Mechanics and Mechanism

This subject is required by all courses and consists of one hundred and five hours of lectures and recitations covering the whole of the first year. The fundamental principles of these subjects are considered of the greatest importance and the applications and problems are selected with special reference to their practical uses in textile machinery. The large variety of mechanism applications met in textile machines makes this course an essential one as a proper preparation for the student's later work in spinning and weaving. During the second term a short time is devoted to a study of the principles of applied mechanics including strength of materials. This work finds its applications in the later study of mill construction. Students in Course VI are also required to take forty-five additional hours on Graphic Statics. Some of the subjects treated in this course are:

Mechanics

Work, power and energy.
Principles of moments.
Simple and compound levers.
Inclined plane and wedge.
Screw and worm wheel.
Parallelogram of forces.

Mechanism

Classification of motions.
Belting problems.
Gearing and gear trains.
Link motions.
Cams and cam design.
Differential and epicyclic trains.

Mechanism of Power Weaving

This course consists of thirty lectures given during the first term of the second year and is required by all the regular students taking power weaving. A thorough analysis of all the important motions of power weaving is undertaken and the treatment is by graphical and analytical methods. The object of this course is to so familiarize the student with the theory of the mechanism of the loom that the time spent in the weave room on loom fixing will be used to the best advantage.

Mechanical Drawing

This course is taken by all regular students during the first term of the first year. The weekly program consists of one lecture and six and one-half hours in the drawing room. This subject is considered of the greatest importance as a preparation for the student's future work and the practical usefulness of drawing of this character is fully emphasized. The course is systematically laid out covering in order the following divisions:

- Care and use of drawing instruments.

- Geometrical constructions.

- Elements of projections and descriptive geometry.

- Isometric projection.

- Developments with practical applications.

- Sketching practice on machine details.

A certain portion of the time is also devoted to the solution of graphical problems in connection with the course in mechanism and mechanics.

Machine Drawing

This work is the continuation of the mechanical drawing and is pursued throughout the entire second term of the first year. This work is wholly of a practical character and includes sketching from textile machinery details, working scale detail and assembly drawing, tracing and blue printing. Students in Textile Engineering being assigned additional time in the drafting room are enabled in many cases to complete a full set of detail drawings for an entire machine. They are also given the rudiments of machine design to supplement the work in strength of materials and machine shop practice.

During the second year all regular students except those of Course IV spend a period of two and one-half hours per week on a series of advanced graphical mechanism problems. The data for all of these problems is in every case taken directly from some of the textile machines that the students meet in other departments. These problems include cam designs for builder motions, mule scroll layouts, scribe builder motion, fly frame cones, mule quadrant motion and a number of others of similar character.

Mill Engineering

This course consists of forty-five lectures and thirty hours of drawing room exercises and is taken by all regular students except those in Course IV, during the third year. This work covers a wide range of subjects and is of the most practical character possible. All of the student's previous work in mechanics, steam engineering, and his knowledge of textile processes is here brought together in the consideration of the larger problems of mill design and "organization." A detailed study is made of the most modern types of mill buildings, including all calculations and drawings. Practice is also given with the engineer's transit and level in the field in plane surveying, setting batters, etc. A considerable time is devoted to a study of the methods of power transmission and the proper arrangement of textile machinery. The problems are in every case taken from actual conditions of mills already built or in process of construction. In addition to the regular exercises the students of the Textile Engineering course are given fifteen additional lectures on steam power plant design and steam plant economies. They are also given a large amount of additional time in the drawing room, enabling them to work out nearly all the problems involved in the design of an entire mill plant. Lectures and problems are also given on other features of mill engineering such as mill heating, ventilation and lighting, humidification and fire protection.

Shop Practice

Systematic instruction is given in the most approved methods of machine shop practice, the object being to familiarize the student with the proper use of hand and machine tools and the characteristics of the different materials worked. Arrangements have been made with a local machine company of such a character as to give the work the greatest educational value and the important commercial element which stimulates the student's interest. Particular attention is given to the form, setting, grinding and tempering of tools and the mechanism of the different machines involving certain speeds, feeds, etc. The course is so planned that the instruction in each typical operation shall conform as nearly as possible to commercial machine shop practice on textile machinery. The list of tools given elsewhere in this bulletin gives an idea of the scope of the work which includes shipping and filing, tool grinding and tempering, straight and taper turning, screw cutting, drilling and boring, planer work, milling machine work, including gear cutting. Instruction is also given in use of wood working tools, both hand and machine and also in forging.

Steam Engineering

This course consists of forty-five lectures and is taken by all regular students during the second year. The purpose of this work is to familiarize the student with the essential elements of power generation and the

means and methods of modern practice in power engineering. The principal phenomena of heat finding application in the steam plant are first thoroughly studied. This is followed by the subjects of fuels, furnaces, stokers, boilers, engines, turbines, condensers and other important features of a steam plant. The lectures pertain mainly to the principles, proper operation and efficient performance of these units, while a standard text book supplies the matter descriptive of the construction details and the different types. Practice with the steam engine indicator, boiler and engine tests are also included in this work. Some time is also given to the study of the modern gas engine and its applications.

In addition to the above, students in Textile Engineering are given fifteen additional lectures, going more fully into the theoretical thermodynamic principles underlying these subjects. They also have opportunity for practical work in a large number of tests in the Engineering Laboratory. (See Engineering Laboratory).

Hydraulics

This subject is presented in a course of fifteen lectures covering the principles of hydraulics, including hydrostatics, measurements of flow of water through orifices, pipes, nozzles and over weirs. The different types of turbines are studied with results of tests and rating tables. Course VI students pursue this course to greater length, supplemented by experiments in the laboratory.

Electrical Engineering

This subject is conducted with the object of giving the students of all courses a general knowledge of the fundamental principles of electricity and magnetism together with the applications as they occur in the textile industry. The course commences with the second term of the second year and continues into the third year.

The instruction is given by means of lectures, recitations, and laboratory work and includes the subjects of Elementary Electricity, Magnetism, Electrical Units, Measuring instruments, Direct current machinery, Generators, Motors, Switchboard design, Systems of Transmitting power by electricity, Electric lighting, Storage batteries, Electrolysis, etc. Following this is a discussion of Alternating Current phenomena, A. C. Generators, Motors, and other apparatus required in the generation and distribution of power by electricity.

Particular attention is given to the applications of electrical engineering in the textile industry and the modern methods of electric driving of textile machinery are made the basis of special study.

Students of Course VI pursue this subject to a greater extent and carry on considerable laboratory work in conjunction with the lectures and recitations.

Mathematics

The subject of Advanced Algebra is taken up by the first year students during the first term. This is presented by means of lectures, class and problem work, and includes the subjects of Theory of Exponents, Quadratic Equations, Ratio and Proportion, Variation, Arithmetical, Geometrical and Harmonical Progression, Undetermined Coefficients, Binomial Theorem, Permutations and Combinations, Graphical Representation and Solution of Equations.

The subject of Plane Trigonometry follows the Advanced Algebra in the last part of the first term and is completed during the second term. Several exercises at the end of this course are devoted to instruction and practice in the use of the slide-rule.

Analytical Geometry

This course commences in the first year and is continued into the second year by students of the Textile Engineering Course. The instruction is given by lectures and class work and considers the subject heads of Loci, Straight Line, Common System of Co-ordinates, Transformation of Co-ordinates. The Circle, Conic Section, Parabola, Hyperbola and Ellipse. These are considered in the reference to both Polar and Rectangular Co-ordinates.

Differential and Integral Calculus

This subject is taken by all Course VI students and extends throughout the third year. It is arranged with the aim to give the students a working knowledge of the subject and to present its application to many engineering problems.

Physics

The course of General Physics is required of all second year regular students. The instruction is given by means of lectures and laboratory work and includes the following subjects:— The Laws of falling bodies, Mass, Density, Momentum, Mechanics, Elementary Principles of Hydrostatics, Sound, which includes a study of the means of propagating and determining velocity of sound, Interference of Sound Waves, Reflection and Refraction of Sound, etc. Considerable time is devoted to the subject of Light in accordance with the modern theory concerning its propagation, measurements of velocity, analysis and interference. The application of laws of mirrors, lenses and prisms as found in the microscope, spectroscope, etc., and consideration of the physical laws underlying color and color effects receive special attention.

Laboratory work is given during the second and third years with the purpose of familiarizing the student with the apparatus available for making general physical measurements as well as special apparatus used in

testing textile materials. Particular attention is given to the method of making observations and the treatment and interpretation of the data so obtained.

Engineering Laboratory

This work is taken only by the students in the Textile Engineering Course during both terms of the second year. The following list of tests indicates the character of the work which is carried on in the engineering laboratory and power plant:

- Efficiency tests of chain block, jack screws, wedges, etc.
- Calibration and use of differential dynamometer.
- Determination of friction of belts.
- Calibration of gauges, thermometers and indicators.
- Use of different types of steam calorimeters.
- Tests on motor driven ventilation fans.
- Test of engine driven fan and heater.
- Test on steam injector and steam pumps.
- Triplex power pump tests.
- Air compressor test.
- Test on centrifugal pump.
- Measurement of flow of water by orifices and weirs.
- Corliss engine tests condensing and non-condensing.
- Valve setting
- Steam Turbine Testing.
- Tests from 10 to 24 hours on 300 Horse Power Aultman and Taylor or 200 Horse Stirling boilers.
- Use of electrical measuring instruments for direct and alternating current.
- Generator tests. Direct and alternating current.
- Motor tests and calibration for power measurements on textile machinery.
- Determination of calorific value of coal.
- Chimney gas analysis.
- Economy tests on 50 Horse Power gas engine.

The tests are taken up in systematic manner and are timed to follow as nearly as possible the lectures and recitations on the same topic.

MODERN LANGUAGES AND HISTORY

English

A technically trained man should be able to express himself clearly, fluently and forcibly, as inability to do so will be a serious handicap to him in after life. The object of the English course is to develop the student's power of expression by a thorough study of the principles of advanced rhetoric and composition and by constant theme writing in order to give him thorough drill in the four forms of discourse, viz. description, narration, exposition, and argumentation. In addition to the study of rhetoric and composition and the writing of themes, several classics such as are not read in the preparatory schools are studied and discussed.

Elementary German

This course is intended for first year students. The first half year is devoted to the study of the rudiments of German grammar, with practice in composition. The work of the second half year consists of the translation of ordinary modern German prose, with frequent practice in reading at sight works along scientific and industrial lines.

Advanced German

The course is intended for those students having an elementary knowledge of the language who wish to become proficient in translating scientific and commercial German. The work of the first half year consists of the reading of scientific German dealing with a variety of subjects. The second half year is devoted to the translation of commercial German with practice in commercial correspondence.

French

The course is designed for students with an elementary knowledge of the language who desire practice in translating scientific and commercial French, together with a review of the elements of grammar and works in composition.

Industrial History

The economic history of a nation is not less interesting or dramatic than its political history, while it is absolutely essential to a thorough understanding of modern business conditions. The object of this course, which is intended for second year students, is to trace the development of the three leading industrial nations of the world, viz. the United States, England, and Germany, from simple, isolated agricultural communities to the complex industrial and commercial society of today. The course consists of weekly lectures supplemented by text-book reading. Among the topics treated are: natural resources; manufactures; agriculture; finance; commerce; transportation; industrial legislation; contemporary problems. During the year each student will be required to write two or more theses on subjects connected with industrial history, in order that he may have practice in research work and also may continue his training in English.

SCHOOL ADMINISTRATION

PRINCIPAL

CHARLES H. EAMES, S. B., Massachusetts Institute of Technology, 1897. Experience: Secretary of the Lowell Textile School and instructor in electrical engineering and mathematics. Superintendent, Light, Heat and Power Company, Lowell, and engineer with Stone and Webster, electrical engineers, Boston, Mass.

INSTRUCTORS

TEXTILE ENGINEERING

GEORGE H. PERKINS, S. B., chief instructor. Massachusetts Institute of Technology, 1899. Associate member American Society of Mechanical Engineers. Experience: Draftsman, Ludlow Manufacturing Company, Ludlow, Mass.; Lockwood, Greene and Co., Boston, Mass.

HERBERT J. BALL, S. B., instructor in mechanical engineering. Massachusetts Institute of Technology, 1906.

ULYSSES J. LUPIN, S. B., instructor in mathematics, physics and electrical engineering. Lawrence Scientific School, 1906. Experience: Draftsman, General Electric Company. Lynn, Mass.; with Winston Company; Metropolitan Water Board.

FELIX D. LANGEVIN, part time instructor in machine shop practice. Lowell Textile School, and assistant superintendent Kitson Machine Shop, Lowell, Mass. Graduate Lowell Textile School. 1904.

CHEMISTRY AND DYEING

LOUIS A. OLNEY, A. C., M. S., chief instructor. Lehigh University, 1896. Experience: Instructor, Brown University; dyeing and finishing departments, Stirling Mills, Lowell, Mass.

MILES R. MOFFATT, S. B., instructor in chemistry. Columbia University, 1901. Experience: Assistant instructor in physics, Columbia University; Chemist, Mallinckrodt Chemical Works, St. Louis, Mo.; Chemist, Atlantic Mills, Providence. R. I.

ROBERT R. SLEEPER, instructor in dyeing. Lowell Textile School, 1900. Experience: Read, Holiday and Sons, Limited, New York City; H. A. Metz and Company, New York City; Hamilton Print Works, Lowell, Mass.; Merrimack Manufacturing Company, Lowell, Mass.

HOWARD D. SMITH, Ph. D., instructor in chemistry. Tufts College, 1906; Brown University, 1904; Rhode Island College, 1901. Experience: Assistant instructor, Brown University; Tufts College; instructor, Beloit College, Wisconsin.

GEORGE A. CUSHMAN, A. M., instructor in Chemistry. Harvard College, 1907.

GEORGE W. HATHORN, assistant instructor in dyeing. Lowell Textile School 1907. Experience: New England Gas and Coke Company, Everett, Mass.; Stirling Mills, Lowell, Mass.; Pemberton Mills, Lawrence, Mass.

WALTER E. HADLEY, instructor in chemistry. Lowell Textile School, 1908.

DECORATIVE ART

HAROLD NICKERSON, S. B., chief instructor. Harvard University, 1905; Honor graduate School of Design, Boston Museum of Fine Arts, 1906. Experience: Little and Brown, Architects, Boston, Mass.

ELIZABETH WHITNEY, instructor in freehand drawing. Normal Art School, Boston, 1882. Pupil of Dr. Denman W. Ross, lecturer in Design, Harvard University. Experience: Teaching, fifteen years.

TEXTILE DESIGN AND POWER WEAVING

FENWICK UMPLEBY, chief instructor. Honor graduate, textile department, Victoria College, Leeds, England, 1884. Experience: James Lees and Sons, Bridgeport, Pa.; chief designer, George H. Gilbert Manufacturing Company, Gilbertville, Mass.; and Globe Manufacturing Company, Utica, N. Y.

ARTHUR F. FERGUSON, instructor in textile design and cloth analysis. Lowell Textile School, 1903. Experience: Chapman, Kendal and Daniels, wholesale dry goods, Boston, Mass.

STEWART MACKAY, instructor in hand loom weaving. Lowell Textile School, 1906.

JOSEPH WILMOT, instructor in power weaving and warp preparation. Lowell Textile School, 1908. Experience: United States Bunting Company, Lowell, Mass.

ALBERT E. MUSARD, instructor in Jacquard weaving. Experience: Oldham Mills, Philadelphia, Pa., and Paterson, N. J.; Gloucester Rug Mills, Gloucester City, N. J.; Binder and Ellis, Philadelphia, Pa.

STARR H. FISKE, assistant instructor in cotton power weaving, Lowell Textile School, 1909.

COTTON YARN

STEPHEN E. SMITH, chief instructor. Lowell Textile School, 1900. Experience: Draftsman, Lowell Machine Shop, Lowell, Mass.; Atlantic Cotton Mills, Lawrence, Mass.; Shaw Stocking Company, Lowell, Mass.

- HERBERT C. WOOD, instructor in cotton yarns. Lowell Textile School, 1906. Experience: Tremont and Suffolk Mills, Lowell; Whitin Machine Works, Whitinsville, Mass.
- HENRY K. DICK, instructor in knitting. Experience: Linnville Hosiery Factory, Lanark, Scotland.

WOOLEN AND WORSTED YARNS

- EDGAR H. BARKER, chief instructor. Massachusetts Institute of Technology, 1896. Experience: Pacific Mills, Lawrence, Mass.; E. Frank Lewis, Lawrence, Wool scouring.
- JOHN N. HOWKER, instructor in wool sorting and scouring. Technical School of Saltaire, near Bradford, England; Certificate from City and Guilds of London. Experience: Saltaire Mills, Yorkshire, England; Goodall Worsted Company, Sanford, Maine; Arlington Mills, Lawrence, Mass.
- HENRY H. CROMPTON, instructor in worsted yarns. Lowell Textile School, 1899. Experience: Arlington Mills, Lawrence, Mass.
- EUGENE C. WOODCOCK, instructor in woollen yarns. Lowell Textile School, 1907. Experience: Wood Worsted Mills, Lawrence, Mass.

FINISHING

- ARTHUR A. STEWART, chief instructor. Lachine Academy, Canada; Lowell Textile School, 1900. Experience: Dominion Woollen Manufacturing Company, Montreal, Canada; American Woollen Company Mills; Nonantum Worsted Mills, Newton, Mass.; instructor, woollen and worsted yarns, Lowell Textile School.

CULTURAL COURSES.

LANGUAGES AND HISTORY

- JOHN CLEMENT, A. B., instructor in commercial languages, English and history, Harvard College, 1894. Experience: Reporter, Boston Evening Transcript; Manager, Lamson, Wolfe and Co., Publishers, Boston; Editorial staff, Charles Dudley Warner's Library of the World's Best Literature, New York; International Library of Famous Literature, New York; teacher, Ballou and Hobigand Preparatory School, Boston.

PHYSICAL CULTURE

- CHARLES R. CHURCH, Physical Director. Lowell Textile School, 1906. Dr. Sargent's School, Cambridge, Mass.
- ARCHIBALD R. GARDNER, M. D., Medical Adviser. Harvard University, 1902.

ALUMNI ASSOCIATION

The Alumni Association of the School holds its annual meeting and banquet in Lowell on commencement day.

The membership of the Association is restricted to graduates of the day school. Honorary membership is open to the Board of Trustees, the Faculty and such others as may be elected by the Association.

The officers for year ending June, 1910 are:

President:	Arthur T. Mullen, '09
Vice-President:	William L. Parkis, '09
Secretary-Treasurer:	Arthur A. Stewart, '00

Board of Directors: The President, Vice-President, Secretary-Treasurer, Henry A. Bodwell, '00, for one year, and Stephen E. Smith, '00, for two years. Communications should be addressed to Arthur A. Stewart, Lowell Textile School.

THE SOUTHWICK TEXTILE CLUB

The object of the Club is to promote the welfare of the School and the social and intellectual interests of its past students.

The membership is restricted to all persons who have attended the day classes of the School for at least one year and who are not, at the time of making application to the Club, students thereof.

The Club was organized on February 23, 1907, and at present has about seventy-five members. The officers of the Club are:

President:	Royal P. White, '04
Vice-President	Arthur C. Varnum, '06
Secretary-Treasurer:	Arthur A. Stewart, '00

Executive Board: President, Vice-President, Secretary-Treasurer, Henry A. Bodwell, '00, and Stephen E. Smith, '00.

DAY CLASS OF 1909

Graduates with Titles of Thesis

Diplomas awarded as follows, June 3, 1909:

- | | | |
|-----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|
| Arthur Travena Brainerd, | Chemistry and Dyeing
Thesis with W. H. Sanborn.
"Resist Dyeing" | Bradford, Mass. |
| Harold Wright Conant, | Cotton Manufacturing,
Thesis with Chester C. Pease.
"The Relation of Twist and Strength." | Littleton Common, Mass. |
| Almonte Harrison Fairbanks, | Wool Manufacturing,
"The Manufacture of Merino Half-Hose." | Wakefield, Mass. |
| William Gladstone Ferguson, | Textile Designing,
"Shaded Effects obtained by the Sateen and Plain Weaves." | Springvale, Maine. |
| Starr Hollinger Fiske, | Wool Manufacturing,
Thesis with H. P. Kay, A. T. Mullen.
"The Manufacture of Fancy Worsteds, (Men's Wear)" | Winthrop, Mass. |
| Arne Kolthoff Gyzander, | Chemistry and Dyeing,
"A Photo-micrographic Study of the Textile Fibers." | Wilmington, Mass. |
| Francis Crawford Holden, | Chemistry and Dyeing,
"Application of Titanium Compounds in Textile Coloring." | Lawrence, Mass. |
| Harry Pearson Kay, | Wool Manufacturing,
Thesis with S. H. Fiske, A. T. Mullen. | Oxford, Maine. |
| James Knowlton Laughlin, | Textile Designing,
"The Art of Producing Variety of Color in Tapestries." | East Greenwich, R. I. |
| Alfred Sandel Levi, | Chemistry and Dyeing,
"The Discharging of Insoluble Azo Colors." | New York City. |
| Archibald Lee Mason, | Textile Engineering,
Thesis, 1908.
"Calibration of a Direct Current Motor and Power Tests on Ring Spinning Frame." | Billerica, Mass. |
| Arthur Thomas Mullen, | Wool Manufacturing,
Thesis with S. H. Fiske, H. P. Kay. | Dorchester, Mass. |
| John Douglas Newall, | Chemistry and Dyeing,
"Comparison of the Coloring Properties of Cutch and Sulphur Brown." | Lawrence, Mass. |
| William Lawton Parkis, | Cotton Manufacturing,
Thesis with Carl H. Potter.
"A Comparison of Single Carding, Double Carding and Combing." | Whitinsville, Mass. |
| Chester Chapin Pease, | Cotton Manufacturing,
Thesis with Harold W. Conant. | Lowell, Mass. |
| Carl Howard Potter, | Cotton Manufacturing,
Thesis with William L. Parkis. | Ludlow, Mass. |
| Walker Flanders Prescott, | Chemistry and Dyeing,
"A Study of Certain Relations which Exist between
Coloring Matters and Cotton and Wool." | Lawrence, Mass. |
| Harold Fairbairn Saunders, | Chemistry and Dyeing,
"Estimation of Hydrocarbon Oils in Wool Lubricants." | Andover, Mass. |
| Ira Aaron Stone, | Chemistry and Dyeing,
"Waterproofing of Cotton Cloth." | Beachmont, Mass. |
| James Carleton Wood, | Chemistry and Dyeing,
Thesis with Harry M. Smith.
"Efficiency Test of an Electrolytic Cell, for the Manufacture of
Sodium Hypochlorite Bleach Liquor." | Haverhill, Mass. |

EVENING CLASS OF 1909.

COURSE I—2 YEARS. (Cotton Spinning)

Certificates awarded as follows, May 5, 1909:

Ernest H. Nelson	Lowell, Mass.
Thomas Robinson	" "
Edward Ryan	" "
Humphrey Francis Sullivan	" "
Michael Leonard Walsh	" "

COURSE IIa—1 YEAR. (Woolen Spinning)

Michael Charles Hayes	North Billerica, Mass.
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COURSE IIb—3 YEARS. (Worsted Spinning)

Arthur Percy Hillier	North Chelmsford, Mass.
John McLay	Lawrence, "
Alfred H. Vogt	" "
Luther Francis Watson	Methuen, "

COURSE III—3 YEARS. (Designing)

Warren Henry Arnold	Lowell, Mass.
Arthur Booth	Methuen, "
Herbert Ellery Bowen	Lowell, "
Frederick Herbert Cockell	Lawrence, "
Ernest Henry Gaunt	Methuen, "
Herbert Eastman Gordon	" "
William Innes Houston	Lawrence, "
Joseph Guy Parsons	Lowell, "
George John Schubert	Lawrence, "
Harry William Schuerfeld	Dorchester, "
Edward Winslow Ware	" "

COURSE III—1 YEAR. Post Graduate. (Designing)

Edward Hanson	Lowell, Mass.
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COURSE III—2 YEARS. Post Graduate. (Designing)

Herbert Bake	Methuen, Mass.
Andrew Molloy	Lowell, "
Arthur Smith	Lawrence, "
William Edward Smith	" "
William Herbert Stopherd	Lowell, "

COURSE IV—4 YEARS. (Chemistry and Dyeing)

Carl A. Anderson	Lowell, Mass.
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COURSE Va—1 YEAR. (Cotton Weaving)

Rothwell Bailey	Lowell, Mass.
Jonas Banks	" "
William Carman	" "
Frank Kent Chesworth	Lawrence, "
Harold Hill	Methuen, "
Edward Arthur Howell	Lawrence, "
Benn Kershaw	Lowell, "
Peter Madden	" "
Paul Alfred Read	" "
John True Tucker	" "

COURSE Vb—1 YEAR. (Woolen and Worsted Weaving)

Richard Allen Buckley	Lowell, Mass.
Raymond Hamer Bunce	" "
Charles Eugene Cowdrey	North Billerica, "
Frank Leslie Davison	" " "
Dennis Joseph Mahoney	" " "
George Buel Palmer	Lowell, "

COURSE Vc—1 YEAR. (Dobby and Jacquard Weaving)

John Joyce	Lowell, Mass.
Albert Edward Musard, Jr.	" "
Richard Young, Jr.	" "

COURSE VIa—3 YEARS. (Mechanics and Electricity)

Charles Edward Dulligan	Lowell, Mass.
Philip Julius Gilinson	" "
Harry Cornelius Holt	" "
Joseph Paquin	" "
Fred Pearson	" "
Carl Winslow Stocks	" "
Alvin Edward Sykes	" "

COURSE VIb—3 YEARS. (Mechanical Drawing)

Benjamin Ludger Benoit	Lowell, Mass.
Carlos Wadleigh Dunning	" "
Harold Francis Kaler	" "
Henry Edmond Lincourt	" "
Charles Gavan McClure	" "
Frank Lewis Orrell	" "
Frederick Albert Weigel	Lawrence, "

COURSE VIc—3 YEARS. (Architectural Drawing)

Bernard Joseph Kelley, Jr.	Lowell, Mass.
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COURSE VIId—3 YEARS. (Freehand Drawing)

Elizabeth Mary Butler	Lowell, Mass.
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COURSE VII—1 YEAR. (Woolen and Worsted Finishing)

Albert Augustus Hodgkins	Lowell, Mass.
George Arnold Smith	Methuen, "
Arthur Clayton Varnum	Lowell, "

REGISTER OF DAY STUDENTS

1909-1910

Third Year

Name	Course	Address
Anderson, William	VI	Andover, Mass.
Arienti, Peter J.	IV	Great Barrington, "
Blaikie, Howard M.	II	Medford, "
Brady, John T., Jr.	II	Albany, N. Y.
Burns, William M.	Sp. IV	Arlington, R. I.
Cary, Julian C.	VI	Lowell, Mass.
Clark, Thomas T.	II	North Billerica, "
Deely, John A.	Sp. III	Pittsfield, "
Donovan, Michael R., Jr.	Sp. III	Lynn, "
Duval, Joseph E.	II	Jamaica Plain, "
Finlay, Harry F.	IV	Lawrence, "
Fletcher, Roland H.	VI	Littleton, "
Gale, Harry L.	III	Cambridge, "
Goldberg, George	VI	Malden, "
Hale, Elliott K.	Sp. III	Lawrence, "
Hardy, Philip L.	VI	Andover, "
Howe, Woodbury K.	I	Groton, "
Hurtado, Leopoldo, Jr.	VI	Mexico City, Mexico
Jelleme, William O.	I	Passaic, N. J.
Keough, Wesley L.	II	Winthrop, Mass.
Kono, Hidesaburo	I	Ozu-machi, Ehime-ken, Japan
Lamb, Arthur F.	II	Rockland, Me.
Leck, Arthur J.	Sp. III	Lawrence, Mass.
Manning, Frederick D.	IV	Fitchburg, "
McCool, Frank L.	IV	Mansfield, "
Morton, John R.	IV	Jamaica Plain, "
Murray, James A.	II	Somerville, "
Nettel, Frank C.	Sp. III	Manchester, N. H.
Nichols, Raymond E.	VI	Wakefield, Mass.
O'Connell, Clarence E.	IV	Andover, "
Putnam, Leverett N.	IV	Danvers, "
Ray, James F.	Sp. III	Greenwich, Conn.
Reed, Norman B.	I	Malden, Mass.
Robson, Frederick W. C.	IV	Lowell, "
Smith, Doane W.	II	Westfield, "
Smith, Theophilus G., Jr.	IV	Groton, "
Stronach, Irving N.	IV	Lowell, "
Vinal, Willis R.	II	" "
Walker, Alfred S.	II	Malden, "
Watson, William	III	Haverhill, "
Whitcomb, Roscoe M.	IV	Winchester, "
Wood, Ernest H.	IV	Andover, "

Second Year

Adams, Tracy A.	IV	East Bridgewater, Mass.
Bailey, Walter J.	IV	Watertown, "
Burnham, George W.	Sp. IIb	Nashua, N. H.
Cameron, Elliott F.	IV	Beverly, Mass.

Name	Course	Address
Chandler, Proctor R.	IV	North Andover, Mass.
Cheney, Henry S.	I	Clinton, "
Chisholm, Lester B.	I	Melrose Highlands, "
Culver, John H.	IV	Groton, "
Dewey, Maurice W.	II	Montpelier, Vt.
Elliot, Gordon B.	II	Grafton, Mass.
Estey, Paul F.	IV	Gardner, "
Ferguson, Eva B.	Sp. IIIb	Lowell, "
Ferrin, George K.	Sp. III	" "
Flynn, Thomas P.	IV	Fitchburg, "
Ford, Edgar R.	IV	Lawrence, "
Gainey, Frank W.	IV	" "
Harrison, Henry H.	I	Reading, "
Hay, Ernest C.	II	Pittsfield, "
Hendrickson, Walter A.	II	Wakefield, "
Hodecker, John N.	IV	Adams, "
Hodgkins, Albert A.	Sp. III	Augusta, Me.
Hubbard, Ralph K.	IV	Norwood, Mass.
Hundley, James W.	I	Baltimore, Md.
Hunton, John H.	II	Newport, N. H.
Jack, Charles H.	VI	Manchester, "
Jefferson, Roswell C.	IV	Lowell, Mass.
Kehew, Walter E.	IV	Somerville, "
Mabbett, Albert L.	Sp. III	Newport, Me.
Manship, Nelson A.	VI	Brookline, Mass.
Marland, Harold W.	VI	Andover, "
Martin, Harry W.	IV	Marblehead, "
Merrill, Allan B.	IV	Lynn, "
Michelson, Harold G.	I	Lowell, "
Middleton, James A.	IV	Ripon, Wis.
Moore, Karl R.	IV	Newton Highlands, Mass.
Morris, Joseph P.	III	Utica, N. Y.
Mudge, Gordon	Sp. III	Lynn, Mass.
Murphy, Howard H.	VI	Boston, "
Murray, Walter R.	Sp. III	Melrose, "
Outwater, John R.	I	Passaic, N. J.
Pearson, Alfred H.	IV	Springvale, Me.
Phillips, Fred T.	IV	Lynn, Mass.
Rich, Everett B.	III	Worcester, "
Sidebottom, Leon W.	IV	Lowell, "
Signor, Clarence E.	IV	Worcester, "
Standish, John C.	IV	Dighton, "
Summersby, George W.	I	Lawrence, "
Thaxter, Joseph B., Jr.	II	Hingham, "
Toshach, Reginald A.	II	Methuen, "
Uschanoff, Nicholas	Sp. II	Helsingfors, Finland
Welch, George C.	I	Stoughton, Mass.
Williams, Harrison M.	II	Haverhill, "

First Year

Allen, Joseph P.	I	Pawtucket, R. I.
Anagnos, Demetrius	I	Lowell, Mass.
Barlow, John R.	Sp. IIIb	Lawrence, "
Bell, William T.	I	Anniston, Ala.

Name	Course	Address
Berger, Robert	IV	Boston, Mass.
Bigelow, Prescott F.	II	Arlington, "
Brown, Rollins	IV	Salem, "
Burke, Henry B.	IV	South Acton, "
Casey, Henry F.	I	Roxbury, "
Caswell, Glen B.	VI	Dracut, "
Clark, Ralph B.	II	Plymouth, "
Coan, Charles B.	IV	Ward Hill, "
Cogswell, Wilder D.	II	Bradford, "
Conant, Richard G.	I	Littleton, "
Cooke, Harrison A.	I	Burlington, Vt.
Crane, Edwin M.	I	Blackstone, Mass.
Dalton, Gregory S.	IV	Lawrence, "
Dalton, John, Jr.	IV	North Adams, "
Davis, Nathaniel L.	II	Haverhill, "
Daw, Arthur J.	IV	North Andover, "
Dearth, Elmer E.	IV	Lowell, "
Demuth, Herbert E.	IV	Lisbon Falls, Me.
Dunning, Hazard A.	II	Cambridge, Mass.
Edmands, Frederick P.	III	Hingham, "
Engstrom, Karl E.	VI	Lancaster, "
Faulkner, Richard M.	II	Keene, N. H.
Frost, Harold B.	II	Somerville, Mass.
Goldman, Edward	VI	Malden, "
Gonzalez, Emilio J.	Sp. VI	Jaro, Iloilo, P. I.
Goodale, William P.	I	Clinton, Mass.
Goodwin, James S.	Sp. III	Amesbury, "
Hartford, Nathan B. E., Jr.	II	Watertown, "
Hartshorn, George T.	II	Norwood, "
Hassett, Paul J.	IV	Fitchburg, "
Hastings, Warren R.	I	Malden, "
Hathaway, Henry B.	III	Salem, "
Heath, Willis S.	Sp. III	Concord, N. H.
Holmes, Otis M.	VI	Haverhill, Mass.
Hood, Leslie N.	IV	Nashua, N. H.
Howard, Frederick S., Jr.	VI	Bradford, Mass.
Huegin, Kurt A.	II	Winchester, "
Jackson, William L.	IV	Flint, Mich.
Jefferson, Pauline C.	Sp. IIb	Lowell, Mass.
Kaplan, Maurice	IV	Boston, "
Kellett, James F.	IV	Amesbury, "
Kelsey, Oscar E.	VI	Lowell, "
King, Dan E.	VI	Millville, "
Lamont, Robert L.	II	Malden, "
Leitch, Harold W.	IV	North Andover, "
Lillis, Marvin H.	IV	Lawrence, "
Lipton, Benjamin	VI	Roxbury, "
Main, Moses T.	IV	Newport, R. I.
McArthur, Arthur, Jr.	II	West Roxbury, Mass.
McCleary, Samuel W.	IV	Amsterdam, N. Y.
McDuff, Henry C.	II	Pawtucket, R. I.
McGowan, William J., Jr.	Sp. IV	Woburn, Mass.
Miner, Carl H.	II	Malden, "
Munroe, Sydney P.	I	Melrose, "
Niven, Robert S.	VI	Concord Junction, "

Name	Course	Address
North, Arthur H., Jr.	II	Roslindale, Mass.
Noyes, Philip A.	III	Haverhill, "
O'Hara, Benjamin F.	IV	Lowell, "
Orpet, Edward O., Jr.	IV	South Lancaster, "
Pensel, George R.	IV	Fitchburg, "
Pottinger, James G.	II	West Roxbury, "
Preston, Harold L.	II	Woonsocket, R. I.
Radcliffe, Arthur D.	II	Shelton, Conn.
Rice, Enoch B.	Sp. III	Belton, S. C.
Ringland, Hans S., Jr.	II	Cambridge, Mass.
Rogers, Miles E.	I	Boothbay Harbor, Me.
Rundlett, Arnold D.	VI	Haverhill, Mass.
*Santry, Walter L.	II	Roxbury, "
Sayward, Ralph K.	I	Winchester, "
Searle, David H.	IV	Chelmsford, "
Seavey, Arthur	VI	Bridgewater, "
Shea, Francis J.	II	Ware, "
Smith, Frank L.	II	Andover, "
Stevens, Howard A.	I	Malden, "
Stubbs, Samuel A.	IV	Haverhill, "
Sullivan, John D.	VI	Bradford, "
Walsh, Martin F., Jr.	IV	Fitchburg, "
Ward, Herbert H.	II	Gilbertville, "
Waterman, Andrew S.	I	Warren, R. I.
Weeks, Harry F.	II	Malden, Mass.
Whitehill, Warren H.	IV	Groton, "
Whittier, Sumner C.	IV	Reading, "
Wise, George F.	IV	Fitchburg, "
Wiswall, Frank T.	II	Lawrence, "
Woodward, Ernest C.	Sp. III	Rockland, "
Yavner, Harry	II	Somerville, "
Zobel, Carl J.	II	Ripon, Wis.

*Deceased

REGISTER OF EVENING STUDENTS

1909-1910

EXPLANATORY NOTE

Course I	Cotton Spinning
Course II (a)	Woolen Spinning
Course II (b)	Worsted Spinning
Course III	Designing
Course IV	Chemistry and Dyeing
Course V (a)	Cotton Weaving
Course V (b)	Woolen and Worsted Weaving
Course V (c)	Dobby and Jacquard Weaving
Course VI (a)	Mechanics
Course VI (b)	Mechanical Drawing
Course VI (c)	Architectural Drawing
Course VI (d)	Freehand Drawing
Course VI (e)	Machine Shop
Course VI (f)	Mathematics
Course VII	Woolen and Worsted Finishing

FOURTH YEAR

Name	Course	Address
Christison, Hugh	IV	Methuen, Mass.
Hurtado, Leopoldo, Jr.	IV	Lowell, "
Jordan, Frederic W.	IV	" "
Kelley, Bernard J., Jr.	P. G. VIc	" "
Lincourt, Henry E.	P. G. VId	" "
Redman, Henry S.	IV	" "
Stewart, William W.	IV	Lawrence, "
Stott, Samuel	IV	" "
Whitney, Frederick A.	IV	Lowell, "

THIRD YEAR

Blaikie, Howard M.	III-VIa	Lowell, Mass.
Brady, John T., Jr.	III	" "
Burgess, Joseph H.	III	Methuen, "
Campbell, Edward G.	VIc	Lowell, "
Carter, Harry L.	VId	" "
Cox, Edward J.	III	" "
Crosby, Wesley R.	VIa	Dracut, "
Delaney, John A.	VIa	Lowell, "
Dulligan, Charles E.	VIa	" "
Dulligan, Lawrence	VIa	" "
Dulligan, Thomas	VIa	" "
Flaherty, William	III	" "
Ford, Alvin M.	VIa	Lawrence, "
Gahm, George L.	IId	" "
Gaspar, Edith E.	VId	Lowell, "
Gilinson, Philip J.	VIa	" "
Gookin, Alice L.	VId	" "

Name	Course	Address
Gray, Robert C.	III	Lawrence, Mass.
Heaton, Forster G.	IV	Lowell, "
Hering, Paul C.	III	Lawrence, "
Hill, Ellsworth O. C.	IIa	" "
Hilliard, William B.	VIa	Lowell, "
Hodgkins, Albert A.	III	" "
Jackson, Frank	VIIb	Methuen, "
Jean, Adhemard C.	VIa	Lowell, "
Jorde, Linville T.	VIc	" "
Kershaw, Samuel S.	IIb	No. Chelmsford, "
Lake, Chester H.	VIa	Dracut, "
Ledoux, Blanche H.	VIId	Lowell, "
Leighton, Frank W.	VIa	" "
Lincoln, Francis J.	VIa	" "
Logan, George H. S.	IV	Lawrence, "
Mabbett, Albert L.	III	Lowell, "
Maxcy, Leo M.	VIc	" "
McAuliffe, Patrick D.	VIIb	" "
Milot, Joseph E.	VIc	" "
Paquin, Joseph	VIa-b	" "
Patterson, Charles L.	IIb	Lawrence, "
Petterson, Birger	VIa	Lowell, "
Phelps, Mary I.	VIId	" "
Quimby, Henry F.	VIa	" "
Reardon, Timothy H.	VIa	" "
Root, Frank, Jr.	III	" "
Sullivan, Michael F.	VIIb	Dracut, "
Walker, Alfred S.	III	Lowell, "
Watson, William	III	" "
Weiss, William P.	IIb	Lawrence, "
Welch, Benjamin L.	VIIb	Lowell, "
Willmott, Herbert J.	VIa	" "

SECOND YEAR

Ansart, Arthur G.	VIa	Lowell, Mass.
Ballinger, William E.	IIb	No. Chelmsford, "
Barnes, Hammond	VIIb	Lowell, "
Brin, Arsene	VIa	" "
Brown, William F.	VIIb	" "
Brunelle, Elodie	VIId	" "
Carp, George W.	IV	" "
Carpilio, John A.	VIa	Lawrence, "
Chadwick, Walter	VIe	Lowell, "
Claus, Emil	III	" "
Cochrane, John	VIIb	" "
Corr, James F.	III	" "
Cote, George W.	VIIb	" "
Cutress, Albert J.	VIe	" "
Dana, Clarence A.	I	" "
Dana, Herbert D.	IV	" "
Dean, Hubert R.	VIIb	Methuen, "
Dixon, Frank H.	VIIb	Collinsville, "
Dunn, George C.	IV	Lowell, "
Enlind, Charles J.	VIc	" "
Fader, Weldon S.	VIIb	" "

Name	Course	Address
Flynn, John	VIe	Lowell, Mass.
Ford, Alvin M.	VIb	Lawrence, "
Fujiyoshi, Heisayu	I	Lowell, "
Garmon, George R.	VIb	" "
Glennon, Edward M.	IV	Lawrence, "
Green, Frank L.	I	Lowell, "
Herdegen, Charles	I	Lawrence, "
Hird, Arthur W.	I	Lowell, "
Hird, James A.	IV	" "
Hodge, William	VIa	Andover, "
Holt, Gavin	IV	Lowell, "
Johnston, James W.	VIa	" "
Keene, Thomas R.	VIb	" "
Kelleher, William P.	VIa	" "
Kelly, Patrick	I	" "
Kennedy, William E.	VIa	Lawrence, "
Kirkpatrick, Albert A.	I	Lowell, "
Lachance, Melina	VI d	" "
LaJeunesse, Joseph A.	IV	" "
Latimer, Thomas	III	Collinsville, "
Leck, Arthur J.	III	Lowell, "
Lee, Coleman H.	IIb	Lawrence, "
Lemire, Arthur	I	Lowell, "
Lindsay, Lewis P.	VIa	Andover, "
Lund, Carl E.	VIa	Lowell, "
Macauley, Daniel C.	VIa	" "
Maker, Isaac A.	VIa	" "
Manning, James B.	IV	" "
McCune, Lawrence B.	VIa	" "
McDonald, Luke J.	III	Collinsville, "
MacDonald, Kenneth W.	VIb	Methuen, "
McKeown, Austin	VIa	Lowell, "
McMahon, John J.	VIa	" "
McMahon, William	VIa	" "
Meloy, Frederick F.	VIa	" "
Morse, Charles H.	I	" "
Mudge, Gordon	III	" "
Mullen, Edward J.	VIb	" "
Nettel, Frank C.	III	" "
Newsholme, Charles E.	VIb	Methuen, "
Nichols, Nathan A.	VIb	Lowell, "
Nicoll, John	IV	Andover, "
Palm, Carl H.	VIa	Lowell, "
Pascall, Arthur F.	VIb	" "
Perry, Clarence R.	IIb	Methuen, "
Quirk, James J.	VIa	Lowell, "
Reardon, Timothy H.	VIa	" "
Rogers, John F.	I	" "
Scannell, George P.	VIb	" "
Scoble, David E.	VIa	Chelmsford, "
Shackleton, John H.	I	Lawrence, "
Smith, Doane W.	VIa	Lowell, "
Stanley, John R.	IIb	No. Chelmsford, "
Stanten, James F.	VIa	Lawrence, "
Staples, Erving E.	VIe	Lowell, "
Stephens, Paul S.	I	" "

Name	Course	Address
Taylor, George A.	III	Methuen, Mass.
Tennant, Joseph A.	VIb	" "
Thomas, Henry W.	I	Lowell, "
Tighe, John J.	VIe	" "
Vinal, Willis R.	VIa	" "
Walker, Alfred S.	III	" "
Ward, Bernard D.	III	" "
Whitman, William P.	IV	" "
Wikstrom, Anders G.	VIa	" "
Williams, Allen R.	I	" "
Williamson, Henry	I	" "
Willmott, Herbert J.	VIa	" "
Worthington, John A.	I	" "

FIRST YEAR

Alexander, William J.	I	Lowell, Mass.
Allen, John J.	VIb	" "
Allen, William J.	IV	Lawrence, "
Alter, Frederick A.	IV	" "
Anderton, Harry	Va	Lowell, "
Andrews, Oliver	I-III	" "
Ansart, Arthur G.	VIa	" "
Archambault, Annette J.	VIId	" "
Armstrong, Lester H.	VIa	" "
Armstrong, Robert J.	Vb	" "
Atkinson, Norman	Vb	" "
Axon, William	VIa	" "
Bailey, Carl E.	I	" "
Baldwin, Thomas	VIa	" "
Banks, Jonas	Vc	" "
Barbera, Antonio A.	VIa	" "
Barmby, Francis	VIa	Methuen, "
Barnes, Joseph	I	Lowell, "
Barthel, Frederic	IV	" "
Bassett, Bryan A.	IV	" "
Bassett, Cyrus J.	VIb	" "
Bastow, Percy	IV	Methuen, "
Baxter, John J.	IIa	Lowell, "
Baxter, Thomas J.	VIb	" "
Bean, Charles R.	VIb	" "
Beane, Arthur H.	VIb	" "
Beauchamps, Frank	Vb	" "
Bergner, William A.	IV	Lawrence, "
Bernard, Joseph E.	VIa	Lowell, "
Bernier, Louis	VIb	" "
Berry, Percy W.	Vb	Lawrence, "
Bibeault, Philip T.	III-IV	Lowell, "
Blake, Chester A.	VIIf	" "
Blamire, Joseph	VIa	No. Andover, "
Blanchette, Eugene	VIId	Lowell, "
Bliss, Harold L.	I	" "
Blomquist, Bror G.	III	Andover, "
Boileau, Edward J.	VIIf	Lowell, "
Bolton, James	III	" "

Name	Course	Address
Bottomley, Edward P.	IIa-III	Alston, Mass.
Bottomley, Lester	III	Methuen, "
Bostwick, John W.	VIa	No. Billerica, "
Boucher, Edmund J.	VIa	No. Chelmsford, "
Bourassa, J. Victor	VIa	Lowell, "
Bourchard, Ethan J.	Vc	" "
Bourchard, Robert R.	Vb	" "
Bourgeault, Eugene	VIb	" "
Bowen, Allyn	VIe	" "
Bowne, Raymond W.	VIb	" "
Brady, Gertrude E.	VId	" "
Brandy, William F.	IV	Lawrence, "
Breck, John W.	VIb	Dracut, "
Brennan, Charles F.	VIa	Lowell, "
Brennan, John F.	VIa	" "
Brennan, John S.	VIa	" "
Breton, Adolph	I	" "
Brin, Arsene	VIa	" "
Broderick, James	IV	" "
Brown, Harry F.	III	" "
Bunce, Raymond H.	I Ib	" "
Burke, Thomas J.	III	Collinsville, "
Buzzell, Fred S.	III	Methuen, "
Byam, Harrison E.	VIa	Lowell, "
Cairns, David	VIb	" "
Callary, James J.	I	" "
Calvert, Ernest	I Ib	" "
Canty, Timothy A.	I-Va	" "
Carey, William H.	VIa	" "
Carlson, Frank W.	VIa	" "
Carman, William	Vb	" "
Carp, George W.	IV	" "
Carp, Harry I.	IV	" "
Carregher, Frederick F.	VIb	" "
Cayten, John G.	III-Va	" "
Champagne, Donat	VIc	" "
Chandonnet, Henry	VIc	" "
Chapdelaine, Alonzo	VIa	" "
Charleton, Peter	III	" "
Chase, Irving	I	" "
Cheney, Henry S.	I	" "
Chesworth, Frank K.	III	Lawrence, "
Cheyne, George	IV	Andover, "
Chisholm, Joseph C.	VIa	No. Billerica, "
Christenson, John O.	VIb	Lowell, "
Clark, John W.	IV	Lawrence, "
Clouette, Delphis Z.	VIc	Lowell, "
Cochrane, William	VIa	" "
Cogger, Frank P.	VIa	" "
Collins, Everett	IV	" "
Condon, John A.	IV	No. Billerica, "
Conley, John	IV	Lowell, "
Conroy, Peter F.	IV	" "
Cook, Arthur	IV	" "
Cook, Walter E.	Vb	" "
Cooper, Arthur E.	VIa	Haverhill, "

Name	Course	Address
Corey, Henry G.	III-IV	Lowell, Mass.
Corron, Wilfrid L.	Vb	" "
Costello, John J.	VIa	" "
Cote, Fred J.	VIa	Lawrence, "
Cowan, Edward S.	VIa	Lowell, "
Cowdrey, Charles E.	IIa	No. Billerica, "
Cox, Thomas	VIb	Methuen, "
Crosby, Wesley R.	VIh	Dracut, "
Daidy, George A.	VIId	Lowell, "
Dana, Herbert D.	IV	" "
D'Anjou, Emma	VIId	" "
D'Anjou, Julia	VIId	" "
Davidson, Robert J.	VIa	" "
Davis, Nathaniel B.	III	" "
Deavitt, John P.	Vb	" "
Deely, John A.	Vb	" "
Delaney, Michael J.	Vb	" "
DeLoria, John A.	VIa	" "
Dennis, George A.	VIa	" "
Desforbes, Edward A.	I	" "
Deslandes, Edward A.	IIa	" "
Desmarais, Philip	VIa	" "
Donnelly, Frank A.	VIa	" "
Donohoe, James A.	VIa	" "
Donovan, Eugene J.	VIa	" "
Doole, James E.	IV	" "
Doole, John T.	IV	" "
Dooley, Peter J.	I	" "
Dore, Albert E.	VIc	" "
Downs, John	VIe	" "
Doyle, Stephen R.	VIa	" "
Dozois, Emilie M.	VIId	" "
Dozois, Henry	III-IV	" "
Dresser, Frank E.	III-IV	" "
Duckett, Fred I.	Vb	Lawrence, "
Dudley, Alexander J.	III	Andover, "
Dulligan, Charles E.	IV	Lowell, "
Dumont, Charles E.	VIa	" "
Dundon, Lawrence	VIa	" "
Edwards, William F.	VIa	" "
Ekengren, Hilding C.	VIId	" "
Eklund, Louis V.	Vb	Dracut, "
Ellis, James R.	VIc	Lowell, "
Ellison, George L.	VIa	Nashua, N. H.
Enlind, Walfred E.	VIc	Lowell, Mass.
Estabrook, Albert E.	VIa	" "
Farrell, Samuel T.	III	" "
Faulkner, Richard M.	IIa	" "
Favro, Charles E.	I	" "
Fenlasson, Harris	VIb	" "
Ferguson, Eva B.	VIc	" "
Ferrin, George K.	I	" "
Field, Leslie A.	IIb	" "
Fielding, Fred	Vc	" "
Flemings, Lester A.	I-Va	" "
Fletcher, Carl E.	VIa	" "

Name	Course	Address
Flynn, Patrick	Vb	Lowell, Mass.
Follansbee, Edgar H.	VIa	Lawrence, "
Fournier, Albert A.	I	Lowell, "
Fournier, Ernest	VIa	" "
Fox, Russell M.	I	" "
Freeman, Ralph W.	IV	" "
Furfey, Frederick F.	IV	" "
Gaffny, John F.	VIc	" "
Gakidis, Alexander N.	IV	" "
Gallagher, Francis	VIe	" "
Gardiner, Bruce E.	VIa	Lawrence, "
Garrity, Joseph F.	VIe	Lowell, "
Garvey, John C.	VIa	" "
Gaunt, Ernest H.	IIb	Methuen, "
Gauthier, William	Vb	Lowell, "
Geary, John W.	IV	" "
Gervais, Armand	I	" "
Gibbons, Martin F.	Vb	" "
Gildee, John J.	VIa	" "
Gill, Jesse B.	VIa	" "
Gilman, Edward T.	VIa	" "
Girard, Henry, Jr.	VIa	No. Chelmsford, "
Glynn, John J.	IV	Lowell, "
Goller, Charles J.	III	Lawrence, "
Goodchild, George	IIb	Lowell, "
Goode, Joseph	Va	" "
Gordon, Loyd H.	VI f	" "
Graves, John F.	VIb	" "
Greenaway, William S.	VIb	" "
Greenburg, Frank J.	IV	" "
Greenhalge, James	III	" "
Groedel, Charles	IIb	" "
Guiney, John P.	IV	" "
Gustafson, Alfred L.	IV	" "
Guyton, Alice K.	VI d	" "
Guyton, Anna P.	VI d	" "
Guyton, Mary L.	VI d	" "
Haley, James A.	VIe	" "
Haley, Michael F.	VIa	" "
Halliwell, Henry	VIa	North Billerica, "
Hamilton, James F.	III-VII	Boston, "
Harrison, Fred N.	VIa	Lowell, "
Hartley, Francis S.	IIb	" "
Hartmann, Gaston	VIa	" "
Hartwell, Marcus H.	I	" "
Hayes, Bartholomew J.	VII	No. Billerica, "
Heap, Joseph A.	III	Lowell, "
Hedin, Einar	VIe	" "
Hedrick, Clifton F.	VI f	" "
Heller, Frank M.	VIa	" "
Herron, Alexander T.	IV	Lawrence, "
Hetu, Isidore J.	III	Lowell, "
Hibbert, George E.	Va	" "
Higgins, Walter	VIb	" "
Higginson, Joseph H.	III	Haverhill, "
Hill, William L.	VIa	Lowell, "

Name	Course	Address
Hillman, Harvey F.	VIa-b	Pelham, N. H.
Hinckley, Forrest C.	VIa	Lawrence, Mass.
Hoar, William H.	Vb	Lowell, "
Hodge, William	VIa	Andover, "
Hoellrich, Martin J.	Vc	Lawrence, "
Hogan, John J.	VIa	Lowell, "
Holdsworth, Frank	IIb	" "
Holland, Walter F.	III	Lawrence, "
Holt, Herbert	VIa	Lowell, "
Hooper, Thomas A.	IIb	Lawrence, "
Hornbrook, James I.	VIa	Lowell, "
Houndre, Enstathius J.	I	" "
Houston, William I.	Vb	Lawrence, "
Howgate, Alfred	IIb	Lowell, "
Hoyle, Richard	IIb	" "
Hubin, Frank J.	I	" "
Hudson, William	VIa	" "
Humphriss, George C.	IIb	" "
Humphriss, Herbert H.	Va	" "
Hunton, John H.	VII	" "
Hurley, Bernard	I	" "
Hurtado, Leopoldo, Jr.	Vc	" "
Hutton, Thomas V.	Vb	" "
Jack, Charles H.	VIc	Pelham, N. H.
Jean, Adhemard C.	VIi	Lowell, Mass.
Jean, Emile A.	VIa	" "
Johnson, Arvid	VIb	" "
Johnson, Henry L.	VIa	" "
Jones, Frederick P.	Vb	" "
Jones, Roy E.	VIb	Pelham, N. H.
Judge, Martin	IIb	Lawrence, Mass.
Kelleher, William P.	VIa	Lowell, "
Kelley, Bernard J., Jr.	VIa	" "
Kennedy, John	IIb	" "
Kent, Arthur	VIa-b	" "
Kerrigan, Arthur J.	VIa	" "
Kershaw, Benn	Vc	" "
Kiley, James F.	I	Boston, "
King, Dan E.	I	Lowell, "
Knight, Perley H.	VIc	" "
Knowles, Robert G.	IV	" "
Kobrin, Harry H.	VIa	" "
Krause, George	VII	Lawrence, "
Kuyriacopulos, John A.	VIa	Lowell, "
Labelle, Joseph A.	VIa	" "
Lagasse, George P.	III	" "
Lake, Chester H.	VII	Dracut "
Lambert, Harry	IIb	Methuen, "
Lapierre, Alderic S.	III	Lowell, "
Laporte, Philip J.	IV	" "
Lareau, Henry E.	VIa	" "
Larkin, Joseph P.	VIb	" "
Larkin, Peter	IV	" "
Lavell, Joseph F.	VIa	No. Chelmsford, "
Lavelle, Walter W.	VIa	Lowell, "
Lawrence, William L.	VIc	" "

Name	Course	Address
Lawson, George D., Jr.	IV	Lowell, Mass.
Leach, Samuel	VII	Methuen, "
Leavitt, John F.	Vb	Lowell, "
Leck, Arthur J.	VII	" "
LeClair, Joseph E.	I	" "
Linberg, Joseph F.	IV	" "
Lincoln, Francis J.	VIa	" "
Lincoln, Frederick A.	IIb-Vc	Cambridge, "
Lincourt, Henry E.	VIa	Lowell, "
Lincourt, Jeanne E.	VI d	" "
Lindsay, Lewis P.	VIa	Andover, "
Linehan, Jeremiah A.	IV	No. Billerica, "
Linkletter, Alfred C.	VIe	Lowell, "
Livingston, Charles H.	I	Lawrence, "
Lowe, John C.	IIb	Methuen, "
Lozeau, Lorette	VI d	Lowell, "
Lund, Carl E.	VIa	" "
Lyons, John A.	VIc	" "
Lyng, Arthur E.	VII	" "
Macauley, Daniel C.	VIa	" "
Mackie, Millard F.	Vb	" "
Madden, Peter	VIa	" "
Maguire, Philip J.	VI f	" "
Mahon, John	VIa	" "
Mahoney, Frank V.	VII	No. Billerica, "
Mahoney, John W.	VIa	Lowell, "
Mahoney, William C.	VIb	" "
Mailloux, Wilmur E.	VIa	" "
Markey, Bernard J.	III	" "
Marsden, Phillips B.	IV	Lawrence, "
Marshall, Harold L.	VIb	Lowell, "
Mason, William D.	I	" "
Massey, John W.	VIa	Lawrence, "
Maxwell, William A.	VIb	Lowell, "
Mayo, Fred R.	IV	" "
McAleer, James F.	IV	" "
McArdle, John	VIa	" "
McCann, George	I	Dracut, "
McCann, Joseph H.	IV	Lowell, "
McCoy, John E.	IV	" "
McCune, Lawrence B.	VIa	" "
McDevitt, Charles	I	" "
MacDonald, Chester W.	VIa	" "
McElroy, Samuel H.	Vb	" "
McGarvey, Joseph T.	III	" "
McGuire, Edward F.	VIb	" "
McHugh, Joseph	VIa	" "
McKenna, Jeremiah J.	III	Dracut, "
McKone, Peter	VIa	Lowell, "
McLay, John	III	Lawrence, "
MacMahon, Sidney D.	IV	Lowell, "
McMahon, Edward F.	VIb	" "
McMahon, James F.	VI d	" "
McMahon, John J.	VIa	" "
McMahon, Joseph	VIa	" "
McMahon, William	VIa	" "

Name	Course	Address
McQuade, John A.	VIe	Lowell, Mass.
Melincoff, John H.	VIa	Lawrence, "
Messiah, Hiram	Vb	" "
Miller, Henry J.	VIa	Lowell, "
Miner, Harry E.	VIa	" "
Minis, Carol	I	" "
Moran, John T.	Vb	" "
Moynahan, John E.	VIa	" "
Mudge, Gordon	VII	" "
Mullen, Albert	I	" "
Mulrooney, John J.	VIe	" "
Murningham, John J.	VIa	" "
Murphy, Leo T.	IV	" "
Murray, William F.	VIa	" "
Neeson, John J.	VII	" "
Neil, James J.	IV	Lawrence, "
Nelson, Ernest H.	Vc	Lowell, "
Nelson, Gustave A.	Vb	" "
Nelson, James A.	I	" "
Nelson, Sigfred	VIe	" "
Newcomb, George L.	VII	" "
Nichols, Clarence W.	Vb	Lawrence, "
Nicoll, George B.	VIa	Andover, "
Nolan, John P.	Vb	Lowell, "
Noyes, Frank J.	I	" "
Ogden, Frank	III	" "
O'Neil, Charles F.	VIf	" "
O'Neill, Jeremiah J.	VIa-f	" "
O'Reilly, Bernard J.	VIa	" "
Orrell, Frank L.	IIb	" "
Outwater, John R.	I	" "
Page, Eugene O.	VIa	" "
Page, Harvey	IV	" "
Palm, Carl H.	VIa	" "
Paquette, Donat N.	III	" "
Parke, Benjamin S.	VIe	" "
Pease, Charles F.	IV	Lawrence, "
Peavey, Harry L.	VIa-b	Dracut, "
Pedler, William A.	IV	Methuen, "
Pendergast, George F.	III	Lowell, "
Perry, William S.	VIb	" "
Peters, Roy A.	VIb	Collinsville. "
Peterson, David E.	VIe-f	Lowell, "
Pinkus, Eugene	III	" "
Polk, Roy A.	VIb	" "
Potter, Joseph H.	IIb	" "
Potter, Richard W.	I	" "
Preston, Richard F.	VIa	" "
Quance, Harry	IIb	Methuen, "
Queenan, Joseph P.	III	Lowell, "
Quigley, James P.	VIa	No. Chelmsford, "
Quinn, Clement D.	IV	Lowell, "
Quinn, Frank J.	VIa	" "
Quirk, James J.	VIa	" "
Racicot, Marie E.	VId	" "
Rank, John T.	III	Lawrence, "

Name	Course	Address
Ransehousen, James E.	VII	Lowell, Mass.
Reynolds, George H.	Va	" "
Rice, Thomas G.	I Ib	" "
Richardson, George F.	Vb	" "
Richter, Edward G.	I	Lawrence, "
Ridyard, James	I Ib-III	Lowell, "
Riley, Edward T.	III	No. Billerica, "
Riley, George H.	I	Lowell, "
Riley, Philip A.	VIa	" "
Roarke, Frank J.	VIe	" "
Roberts, Richard E.	VIb	" "
Robinson, Thomas	Vc	" "
Rogers, John F.	I	" "
Rooney, Hugh M.	III	" "
Rowlands, Harold	I	Needham, "
Ryan, John A.	VIa	Lowell, "
Sanborn, Edith T.	VI d	" "
Sanger, Clarence E.	VIc	" "
Santos, Anthony	VIa	" "
Savage, Charles F.	IV	" "
Savage, Thomas J.	IV	" "
Sawyer, Walter H.	VIa	" "
Scholefield, Joseph	VIa	" "
Schulze, George G.	VIa	" "
Scidmore, Russell P.	VIb	" "
Scott, Thaddeus L.	I	" "
Shaffer, William A.	VIe	" "
Shafter, Ernest A.	VIa	Chelmsford, "
Shaw, Charles J.	VIa	Lowell, "
Shaw, Elmer T.	VIa	" "
Shaw, Harold W.	VIa	" "
Shea, James P.	IV	" "
Shea, James T.	VIa	" "
Shinnick, George H.	VIa	Lawrence, "
Sladen, Frank E.	VIa	Lowell, "
Smith, Nathan F.	VIa	" "
Smith, William F.	VIe	" "
Sprague, Harry R.	VIa-f	" "
Stanten, James F.	VIa	Lawrence, "
Starkey, Daniel E.	I	Lowell, "
Stevens, Frank W.	VIf	" "
Stevens, Harold S.	III	Haverhill, "
Stevenson, William G.	VIe	Tewksbury, "
Stewart, George	I-III	Lowell, "
Stopherd, William H.	VII	" "
Stott, Bertram S.	Vb	Andover, "
Stratton, Herbert E.	Va	Lowell, "
Sturtevant, Herbert M.	VIf	" "
Sugden, Albert G.	III	" "
Sullivan, Edward F.	VIa	Lawrence, "
Sullivan, Francis J.	Va	Lowell, "
Sullivan, Timothy P.	VIc	" "
Surprenant, Armand	VIa	" "
Swanson, Victor E.	IV-VIb	" "
Swanson, Walter A.	VIa	" "
Sykes, Alvin E.	VIf	" "

Name	Course	Address
Talbot, Sarphiels	VIa	No. Chelmsford, Mass.
Taylor, Harold S.	VIb	Lowell, "
Taylor, Richard W.	VII	Lawrence, "
Taylor, Wilfred H.	IIa	Lowell, "
Teague, Edward F.	VIa	" "
Tellier, Herman	VIa	" "
Thatcher, Henry T.	IIa-III	No. Chelmsford, "
Theriault, Frederick A.	VIa	Lowell, "
Thomas, Raymond J.	VIa	" "
Thorpe, George H.	III	" "
Todd, Henry	VII	Andover, "
Towle, Richard A.	I	Lowell, "
Townson, Hartley J.	Vb	" "
Tristan, Valentine	IV	" "
Trudeau, Raymond E.	VIb	" "
Trull, Elmer	VIe	" "
Tucker, John T.	Vc	" "
Tucker, William G.	III	" "
Turgeon, Roderick	IV	" "
Uschanoff, Nicholas	III-VII	" "
Vallerand, Hermidas J.	I	" "
Victory, Ralph H.	VIf	" "
Vigeant, Leo A.	VIa	" "
Wakefield, Howard E.	IV	" "
Wallace, David C.	Vc	Lawrence, "
Walworth, George W.	VIa	Lowell, "
Ware, Edward W.	Va	Dorchester, "
Watkins, Leo J.	VIa	Lowell, "
Watson, George, Jr.	VIId	" "
Weare, Charles H., Jr.	I	Shirley, "
Webster, Herbert	VIa	Methuen, "
Weiss, Herbert	III	Lawrence, "
Wessen, Carl E.	III	Lowell, "
Whitman, William P.	IV	" "
Whittaker, Thomas B.	III	Lawrence, "
Wicks, Frederic M.	III	Methuen, "
Wiggin, Fred F.	VIc	Lowell, "
Wiggin, Leon M.	IIb	" "
Wilbur, Roy O.	VIb	" "
Wild, Thomas	VIb	" "
Wilkinson, William N.	VIb	Lawrence, "
Williams, Allen R.	I	Lowell, "
Wilson, Percy L.	III	" "
Wirt, Edward R.	VIb	" "

SUMMARY

Day Students	185
Evening Students	623
Total	808
Names counted twice	52
Net Total	756

ALPHABETICAL REGISTER OF GRADUATES

Name	Course	Class	Day or Evening
Abbott, Edward M.	II	1904	D
Abbott, George R.	II	1908	D
Abbott, Paul W.	I	1906	E
Ackroyd, Theodore C.	IIb	1907	E
Adams, Henry S.	IIa	1903	E
Adams, Henry S.	I	1905	D
Adams, Michael E.	VI	1904	E
Adams, William R.	IIa	1902	E
Amiot, Louis H.	Va	1906	E
Anderson, Carl A.	IV	1909	E
Armstrong, Elias B.	IIb	1906	E
Arnold, Warren H.	VII	1908	E
Arnold, Warren H.	III	1909	E
Arundale, Henry B.	II-III-V	1905	D
Arundale, Henry B.	II	1907	D
Aspinwall, William	IIb	1901	E
Avery, Charles H.	II	1906	D
Bailey, Joseph W.	I	1899	D
Bailey, Rothwell	Va	1909	E
Bain, William A.	VII	1907	E
Bake, Herbert	III	1905	E
Bake, Herbert	P. G. III	1906	E
Bake, Herbert	VII	1907	E
Bake, Herbert	P. G. III	1909	E
Baldwin, Arthur L.	IV	1900	D
Baldwin, Frederick A.	II	1904	D
Ballard, Horace W. C. S.	IV	1908	D
Ballinger, Frederick W.	IIb	1907	E
Balmforth, James H.	IIa	1903	E
Balmforth, James H.	IIa-b	1904	E
Balmforth, William F.	VI	1904	E
Balmforth, Martha B.	(See French)		
Banks, Jonas	Va	1909	E
Barber, James E.	IIb	1907	E
Barker, John P.	V	1904	E
Barlow, Robert	V	1902	E
Barr, I. Walwin	I	1900	D
Barraclough, John C.	I	1907	E
Barrington, James L.	IV	1908	E
Barrington, John A.	IV	1904	E
Barry, Edward J.	III	1903	E
Bastow, Henry	III	1903	E
Bastow, Henry	V	1905	E
Bastow, Stephen W.	IV	1907	E
Baxter, Alvah J.	IIa	1903	E
Bayard, Pierre P.	III	1907	E
Begen, Thomas W.	IIb	1907	E
Begen, Thomas W.	IIb	1908	E
Bell, Frederick W.	IIa	1905	E
Bennett, Edward H.	V	1903	D
Benoit, Benjamin L.	VIb	1909	E
Benoit, William A.	Va	1907	E
Berry, Alfred H.	VI	1908	E

Name	Course	Class	Day or Evening
*Berry, Frank M.	III	1899	E
*Berry, Frank M.	V	1901	E
Binns, Heaton	II-V	1899	E
Binns, Heaton	VI	1902	E
Bloom, Wilfred N.	IV	1903	D
Bodwell, Henry A.	II	1900	D
Booth, Arthur	III	1909	E
Boucher, John L.	VI	1904	E
Bouille, Arthur L.	Vb	1907	E
Bowen, Herbert E.	III	1909	E
Bowie, Samuel A.	VI	1905	E
Bowring, George P. B.	VI	1902	E
Boyd, George A.	I	1905	D
Bradford, Roy H.	II	1906	D
Bradley, Richard H.	V	1901	D
Brainerd, Arthur T.	IV	1909	D
Brainerd, Irving L.	I	1902	E
Brannen, Leon V.	III-V	1907	D
Brannen, Leon V.	IIa	1907	E
Brickett, Chauncey J.	II	1900	D
Broadbent, James H.	Vb	1908	E
Broadbent, James T.	I	1899	E
Broadbent, William	Vb	1908	E
Brooks, Noah	III-V	1901	E
Brouder, John J.	III	1906	E
Brouder, John J.	VII	1907	E
Brown, James P.	III	1905	E
Brown, James P.	P. G. III	1906	E
Brown, James T.	III	1908	E
Brown, William G.	IIb	1906	E
Bryant, Ernest L.	VI	1905	E
Buchan, Donald C.	II	1901	D
Buckley, Harry	IV	1908	E
Buckley, Richard A.	Vb	1909	E
Bucklitsch, Gustave J.	IIb	1907	E
Bunce, Raymond H.	Vb	1909	E
Burgess, Joseph H.	Va	1906	E
Burgess, Joseph H.	Vb	1907	E
Burghardt, Edward S.	IIa	1902	E
Burghardt, Paul C.	IIa	1901	E
Burke, Thomas F.	I	1905	E
Burnham, Frank E.	IV	1902	D
Burnham, Joseph W.	III	1906	E
Burnham, Wilmont V.	Vb	1906	E
Burns, Edward J.	IV	1905	E
Burns, James E.	IV	1905	E
Burrage, Katherine C.	IIIb	1899	D
Burrage, Katherine C.	P. G. IIIb	1900	D
Butler, Benjamin O.	VI	1904	E
Butler, Elizabeth M.	VIId	1909	E
Butterworth, Charles A.	Va	1907	E
Butterworth, John A.	IIb	1907	E
Buzzell, William O.	III	1901	E
Buzzell, William O.	P. G. III	1902	E

*Deceased

Name	Course	Class	Day or Evening
Byam, Walter S.	VI	1903	E
Cady, Dennis J.	V	1903	E
Callahan, Patrick A.	VI	1904	E
Campbell, Albert D.	IIb	1900	E
Campbell, Archibald	IV	1908	E
Campbell, Laura E.	IIIb	1900	D
Campbell, Louise P.	IIIb	1903	D
Campbell, Orison S.	II	1903	D
Carden, Francis E.	IIb	1907	E
Carden, Francis E.	IIb	1908	E
Carlson, Ernest B.	IIb	1907	E
Carman, William	Va	1909	E
Carney, William J.	I	1908	E
Caron, Cleophas	I	1905	E
Carr, George E.	I	1905	D
Carter, Charles R.	Vb	1908	E
Carter, Robert A.	IV	1902	D
Cawthra, Albert B.	IIb	1900	E
Chamberlin, Frederick E.	I	1903	D
Cheetham, John James	III	1901	E
Cheetham, John James	P. G. III	1902	E
Cheetham, John Joseph	I	1904	E
Chesworth, Frank K.	Va	1909	E
Chippindale, Ernest W.	IIb	1901	E
Church, Charles R.	II-V	1906	D
Churchill, Charles W.	III	1906	D
Clapp, F. Austin	II	1904	D
Clogston, Raymond B.	IV	1904	D
Cockell, Frederick H.	III	1909	E
Colby, Arthur D.	I	1900	E
Cole, Edward E.	IV	1906	D
Cole, James T.	II	1905	D
Collier, John	III	1899	E
Collier, John	P. G. III	1902	E
Collins, John A.	IIa-b	1905	E
Coman, James G.	I	1907	D
Conant, Harold W.	I	1909	D
Conklin, Jennie G.	IIIb	1905	D
Conley, Frederick A.	VI	1904	E
Connors, Edward F.	VI	1904	E
Cook, Cheney E.	III	1905	E
Corr, Eben W.	Vb	1908	E
Corr, James F.	Vb	1908	E
Cowdell, Herbert	V	1901	E
Cowdrey, Charles E.	V	1902	E
Cowdrey, Charles E.	Vb	1909	E
Craig, Albert W.	IV	1907	D
Craig, Clarence E.	III	1902	D
Craven, Harry	VII	1908	E
Cremin, Daniel J.	I	1902	E
Crompton, Henry H.	II	1899	E
Culver, Ralph F.	IV	1904	D
Curran, Charles E.	II-III-V	1902	D
Currier, Herbert A.	I	1906	D
Currier, John A.	II	1901	D

Name	Course	Class	Day or Evening
Curtis, Frank M.	I	1906	D
Curtis, William L.	II	1905	D
Custer, James J. E.	V	1905	E
Cutler, Benjamin W., Jr.	III	1904	D
Cuttle, James H.	II	1899	D
Dana, Clarence A.	VI	1905	E
Davis, Henry	IIb	1901	E
Davis, Prentice T.	I	1904	E
Davison, Frank L.	Vb	1909	E
Delmage, Edward R.	III	1904	E
Dempsey, John W.	IIa	1904	E
Dewey, James F.	II	1904	D
Dick, Hugo P.	III	1905	E
Dick, Hugo P.	P. G. III	1906	E
Dick, Hugo P.	IIb	1907	E
Dick, Hugo P.	Vb	1908	E
Dickson, Andrew	IIa	1906	E
Dillon, James H.	III	1905	D
Dimlick, Benjamin C.	III	1905	E
Dimlick, Benjamin C.	P. G. III	1906	E
Dixon, Arthur	III	1908	E
Dobbs, Willie	IIb	1907	E
Dobbs, Willie	IIb	1908	E
Dodge, Charles P.	IIa	1907	E
Dodge, Frank	I	1906	E
Donahue, Michael F.	VI	1904	E
Donald, Albert E.	II	1904	D
Donnellan, Frank T.	IIa	1902	E
Donnellan, Frank T.	V	1903	E
Donnelly, James	I	1900	E
Donovan, Daniel F.	IIa	1901	E
Doole, George L.	VI	1904	E
Dooley, Edward W.	VI	1904	E
Duce, Benjamin	III	1906	E
Duce, Benjamin	VII	1907	E
Dudley, George E.	I	1902	E
Duggan, Francis P.	VI	1904	E
Dulligan, Charles E.	VIa	1909	E
Dunn, George C.	III	1908	E
Dunning, Carlos W.	VIb	1909	E
Dwight, John F., Jr.	II	1908	D
Ehrenfried, Jacob B.	II-V	1907	D
Ellis, George W.	VII	1906	E
Elston, Fred R.	III	1900	E
Emerson, Frank W.	II	1903	D
Erbe, Gustave	VI	1905	E
Evans, Alfred W.	III	1903	D
Evans, William R.	III	1903	D
Evison, William A.	V	1901	E
Ewer, Nathaniel T.	IV	1901	D
Eyers, John T.	IV	1906	E
Fairbanks, Almonte H.	II	1909	D
Farmer, Chester J.	IV	1907	D
Farr, Leonard S.	II	1908	D
Farrell, Thomas	IIa	1901	E

Name	Course	Class	Day or Evening
Fels, August B.	II	1899	D
Ferguson, Arthur F.	I	1902	D
Ferguson, Arthur F.	I	1903	D
Ferguson, Thomas	V	1902	E
Ferguson, William G.	III	1909	D
Field, Charles W.	VI	1902	E
Fiske, Starr H.	II	1909	D
Fleming, Frank E.	IV	1906	D
Flint, Leon G.	III	1907	E
Flynn, John J.	VI	1903	E
Flynn, William J.	Vb	1908	E
Forrest, Fred G.	IIa	1902	E
Fortune, David A.	IIb	1902	E
Foster, Clifford E.	II	1901	D
Foster, Sherwood L.	I	1905	E
Frame, William	V	1901	E
Frank, Emil M.	III	1904	E
Frank, Emil M.	P. G. III	1906	E
Frechette, Alphonse J.	IIb	1907	E
French, Ernest J.	I	1905	E
French, Martha Balmforth	III	1903	E
Fuller, George	I	1903	D
Fuller, John M.	V	1906	E
Gagan, John H.	V	1901	E
Gahm, George L.	II	1906	D
Garner, William	III	1903	E
Gaunt, Alfred C.	III	1899	E
Gaunt, Alfred C.	P. G. III	1902	E
Gaunt, Alfred C.	IIa	1903	E
Gaunt, Alfred C.	IIb	1904	E
Gaunt, Ernest H.	III	1909	E
Gay, Earle B.	I	1905	E
Gay, Olin D.	II	1908	D
Gerrish, Walter	III	1903	D
Gilinson, Philip J.	VIa	1909	E
Gillispie, James E.	VII	1907	E
Gillon, Sarah A.	IIIb	1906	D
Good, Henry	I	1902	E
Goodchild, George	I	1903	E
Goodchild, George	VI	1905	E
Goodhue, Amy H.	(See Harrison)		
Gordon, Herbert E.	III	1909	E
Grant, Archibald	IIb	1901	E
Gray, Finley M.	VI	1903	E
Greenhalge, James	Vc	1908	E
Gregson, Robert B.	Va	1906	E
Gregson, Robert B.	I-Vc	1907	E
Grouke, Michael	IIb	1901	E
Gyzander, Arne K.	IV	1909	D
Haartz, John C.	VII	1907	E
Haas, Ignatius	I	1907	E
Hadley, Walter E.	IV	1908	D
Haigh, Walter	III	1902	E
Haigh, William	Vb	1906	E
Hallbauer, William R.	Vb	1908	E

Name	Course	Class	Day or Evening
Halsell, Elam R.	I	1904	D
Hamblett, Harry A.	I	1907	E
Hanglin, Albert J.	IV	1907	E
Hanglin, William E.	Vb	1907	E
Hanson, Edward	III	1908	E
Hanson, Edward	P. G. III	1909	E
Harder, Elmer E.	VI	1905	E
Hardman, David B.	IV	1908	E
Harmon, Charles F.	I	1899	D
Harris, Charles E.	I	1905	D
Harris, George S.	I	1902	D
Harris, Louis	VII	1908	E
Harrison, Amy Goodhue	IIIb	1900	D
Harrison, Amy Goodhue	P. G. IIIb	1901	D
Hartwell, Henry E.	VI	1906	E
Haskell, Spencer H.	II	1907	D
Haskell, Walter F.	IV	1902	D
Hathorn, George W.	IV	1907	D
Haven, George W.	III	1905	E
Haworth, Joseph	VI	1902	E
Hayes, Michael C.	IIa	1909	E
Hebert, Charles L. J.	IV	1907	E
Hempel, Frank	V	1904	E
Hennessey, Ambrose M.	VII	1908	E
Hennigan, Arthur J.	II	1906	D
Higgins, James A.	IIa	1903	E
Higgins, James A.	IIa-b	1904	E
Hildreth, Harold W.	II-V	1906	D
Hildreth, Harold W.	II	1907	D
Hill, Daniel	IIb	1901	E
Hill, Harold	I	1908	E
Hill, Harold	Va	1909	E
Hillier, Arthur P.	IIb	1909	E
Hintze, Thomas F.	I	1906	D
Hitchcock, Thomas B.	I-IIa-III	1901	E
Hitchen, Harry S.	Vb	1907	E
Hitchen, Thomas G.	Vb	1907	E
Hodgkins, Albert A.	VII	1909	E
Hoellrich, Martin J.	Vb	1908	E
Hoessler, Carl, Jr.	III	1906	E
Hogan, James A.	V	1902	E
Holden, Francis C.	IV	1909	D
Holgate, Benjamin	III	1902	D
Holgate, Benjamin	V	1903	D
Holgate, Charles H.	IIa	1901	E
Hollings, James L.	I	1905	D
Holt, Harry C.	VIa	1909	E
Hook, Russell W.	IV	1905	D
Horsfall, George G.	II-III-V	1904	D
Houston, William I.	III	1909	E
Howard, John	V	1900	E
Howard, John	III	1903	E
Howard, John	IIa	1906	E
Howard, John	VII	1907	E
Howard, Thomas	V	1905	E

Name	Course	Class	Day or Evening
Howell, Edward A.	Va	1909	E
Hoyle, Edward	IIb	1902	E
Hoyle, Joseph	IIb	1904	E
Hoyt, Charles W. H.	IV	1907	D
Huising, Geronimo H.	J	1908	D
Hunt, Chester L.	III	1905	D
Hunt, Herbert R.	VI	1905	E
Hunter, Ralph	III	1901	E
Hunter, Ralph	V	1903	E
Hunton, Lewis G.	IV	1905	E
Hutton, Clarence	V	1900	E
Hutton, Clarence	III	1903	D
Hutton, Harold	V	1906	E
Hutton, John M.	Vb	1906	E
Ignatius, Pentti	Va	1907	E
Inberg, Magnus	I	1906	E
Ingham, Benjamin W.	I	1908	E
Jeannotte, Arthur	VI	1904	E
Jenckes, Leland A.	VI	1908	D
Jennings, James J.	III	1903	E
Jepson, Harry	Vb	1907	E
Johnson, Ernest A.	IIa-b	1902	E
Johnson, Ernest A.	V	1906	E
Johnson, Samuel L.	V	1903	E
Jones, Everett A.	II	1904	D
Jones, Everett A.	III	1905	D
Jones, William J.	IIb	1900	E
Jones, William J.	IIa	1901	E
Joyce, John	Vc	1909	E
Jury, Alfred E.	IV	1904	D
Kaler, Harold F.	VIb	1909	E
Kay, Harry P.	II	1909	D
Keleher, John J.	IIb	1903	E
Kellett, Irvine	II	1899	E
Kelley, Bernard J., Jr.	VIc	1909	E
Kelley, Michael H.	I	1902	E
Kelley, Michael H.	III	1907	E
Kent, Clarence L.	III-V	1906	D
Kent, Ernest J.	IIb	1902	E
Kenworthy, Joseph	I	1905	E
Kershaw, Benn	Va	1909	E
Kershaw, William E.	V	1904	E
Kidd, Thomas E.	IV	1906	E
Killerby, Walter	IIb	1901	E
Kimball, Irving D.	VI	1905	E
Kingsbury, Percy F.	IV	1901	D
Kirsch, Alfred O.	Vb	1907	E
Knowland, Daniel P.	IV	1907	D
Knowles, Frank E.	I	1903	E
Laffert, August W.	III	1906	E
Laffert, August W.	VII	1907	E
Lagerblad, Jarl	VII	1908	E
Lake, William F.	III	1907	E
Lake, William F.	P. G. III	1908	E
Lakeman, Fannie S.	IIIb	1900	D

Name	Course	Class	Day or Evening
Lamont, Walter M.	IIb	1902	E
Lamson, George F.	I	1900	D
Lamson, George F.	VI	1903	E
Lane, John W.	I	1906	D
Lane, John W.	I-V	1907	D
Langevin, Felix D.	VI	1904	E
Laughlin, James K.	III	1909	D
Law, Alfred	IIb	1901	E
Lawliss, Augustine J.	V	1902	E
Lawrence, Charles	I	1903	E
Leach, John P.	I-V	1900	D
Leach, Joseph W.	V	1903	E
Lee, Charles	I	1902	E
Lee, William H.	V	1905	D
Leith, Edwin E.	III	1902	E
Levi, Alfred S.	IV	1909	D
Lewis, LeRoy C.	IV	1908	D
Lewis, Walter S.	IV	1905	D
Libby, C. Robert	VI	1902	E
Lincourt, Hector L.	VI	1903	E
Lincourt, Henry E.	VIb	1909	E
Linkletter, Alfred C.	VI	1905	E
Lord, Harry D.	III	1904	E
Lord, Wilfred	III	1901	E
Lord, Wilfred	IIb	1903	E
Lord, Wilfred	IIa	1904	E
Lovell, Charles E.	VI	1905	E
Lucey, Edmund A.	II	1904	D
Mackay, Stewart	III	1907	D
MacPherson, Wallace A.	III	1904	D
Madden, Peter	Va	1909	E
Maden, Harry	IIb	1900	E
Maguire, James H.	VI	1905	E
Maguire, James H.	I	1906	E
Mahoney, Dennis J.	Vb	1909	E
Mailey, Howard T.	II	1908	D
Maker, Isaac A.	I	1908	E
Marjerison, Isaiah D.	II	1899	E
Marjerison, T. Sydney	III	1907	E
Marjerison, T. Sydney	P. G. III	1908	E
Marinel, Walter N.	I	1901	D
Marshall, Fred K. R.	VI	1908	E
Martin, John C., Jr.	IIa-b	1905	E
Martin, Willard E.	III	1907	E
Mason, Archibald L.	VI	1909	D
Mason, Frederick A.	I	1903	E
McAlister, John W.	V	1899	E
McBride, Robert G.	IIa	1904	E
McCarthy, Joseph F.	III	1906	E
McClure, Charles G.	VIb	1909	E
McDonnell, William H.	I-V	1906	D
McGill, William E.	VII	1908	E
McGovern, James	VII	1908	E
McKenna, Hugh F.	IV	1905	D
McKenna, Jeremiah J.	Vb	1908	E

Name	Course	Class	Day or Evening
McLaughlin, Peter J.	I	1906	E
McLay, John	Vb	1906	E
McLay, John	IIb	1909	E
McManus, Hugh	V	1905	E
McQuade, Hugh B.	V	1901	E
Meadows, William R.	I	1904	D
Meek, Lotta	IIIb	1907	D
Merchant, Edith C.	IIIb	1900	D
Merrill, Edwin C.	VI	1904	E
Merriman, Earl C.	II	1907	D
Michelmore, Harry	III	1906	E
Michelmore, Harry	VII	1907	E
Midwood, Arnold J.	IV	1905	D
Miller, Emil H.	V	1904	E
Minge, Jackson C.	I-V	1901	D
Minge, Jackson C.	III	1901	E
Moir, Alexander L.	III	1899	E
Moir, Alexander L.	P. G. III	1903	E
Molloy, Andrew	V	1902	E
Molloy, Andrew	III	1905	E
Molloy, Andrew	P. G. III	1906	E
Molloy, Andrew	P. G. III	1909	E
Moore, Everett B.	I	1905	D
Moorehouse, Thomas	VI	1904	E
Moorhouse, William R.	IV	1901	D
Morris, Frank A.	V	1901	E
Morrison, Fred C.	I	1903	D
Mortenson, Carl W.	III	1903	E
Mortenson, Carl W.	IIa	1908	E
Morton, Albert N.	IIb	1906	E
*Mozley, Arthur	VI	1903	E
Mullen, Arthur T.	II	1909	D
Murphy, Cornelius D.	IIa	1906	E
Murphy, John H.	VI	1904	E
Musard, Albert E., Jr.	Vc	1909	E
Myers, James W.	III-IV	1903	E
Myers, James W.	VII	1907	E
Najarian, Garabed	IV	1903	D
Nelson, Charles E.	IIb	1907	E
Nelson, Ernest H.	IIb	1900	E
Nelson, Ernest H.	IIa	1901	E
Nelson, Ernest H.	III	1906	E
Nelson, Ernest H.	I	1909	E
Newall, J. Douglas	IV	1909	D
Newcomb, Guy H.	IV	1906	D
Nicholson, Richard	IIb	1903	E
Noble, John T.	V	1899	E
Noble John T.	III	1901	E
Noonan, Denis T.	III	1903	E
Notman, Frederick W.	I	1904	E
Nugent, Thomas A.	II-V	1899	E
Nugent, Thomas A.	VI	1902	E
Nutter, James R.	VI	1908	E
O'Brien, David A.	IV	1906	E

*Deceased

Name	Course	Class	Day or Evening
O'Brien, Michael F.	IIb	1907	E
O'Donnell, John D.	I	1904	D
Ogley, Samuel A.	IIb	1900	E
O'Hara, William F.	IV	1904	D
O'Neill, Peter F.	IV	1905	E
Orrell, Frank L.	VIIb	1909	E
*Osbeck, William J.	III	1908	E
Osgood, Charles F.	I	1900	E
Osgood, Charles F.	VI	1902	E
Overend, John	V	1905	E
Palmer, G. Buel	III	1903	E
Palmer, G. Buel	Vb	1909	E
Paquin, Joseph	VIa	1909	E
Parker, B. Moore	I	1901	D
Parker, Everett N.	I	1904	D
Parker, Everett N.	I	1905	D
Parker, Harry C.	V	1900	D
Parkis, William L.	I	1909	D
Parsons, Joseph G.	III	1909	E
Patrick, Alexander	III	1904	E
Patterson, Alfred H.	III	1908	E
Pearson, Fred	VIa	1909	E
Pease, Chester C.	I	1909	D
Pedler, William A.	I	1906	E
Peel, Hudson	IIb	1901	E
Perkins, John E.	III	1900	D
Perkins, J. Dean	III	1908	D
Perkins, Thomas, Jr.	I	1908	E
Petty, George E.	I-V	1903	D
Picken, William	III	1908	E
Pihl, Christian E.	VI	1906	E
Pittendreigh, John M.	I	1906	E
Plumer, Paul T.	Vb	1908	E
Porter, George K., Jr.	III	1907	E
Porter, George K., Jr.	P. G. III	1908	E
Potter, Carl H.	I	1909	D
Potter, Richard W.	V	1902	E
Pradel, Alois J.	III	1900	D
Pradel, Anna Walker	IIIb	1903	D
Preble, George A.	III	1908	E
Prescott, Walker F.	IV	1909	D
Prince, Sylvanus C.	VI	1908	D
Proctor, Braman	IV	1908	D
Ramsdell, Theodore E.	I	1902	D
*Rasche, William A.	III	1903	D
Raymond, Charles A.	IV	1907	D
Read, Paul A.	VII	1907	E
Read, Paul A.	Va	1909	E
Reardon, Timothy H.	VI	1906	E
Redman, Henry S.	III	1904	E
Redman, Henry S.	V	1905	E
Redman, Henry S.	I	1907	E
Reed, Foster C. K.	VI	1904	E
Reynolds, Eugene A.	VI	1906	E

*Deceased

Name	Course	Class	Day or Evening
Reynolds, Fred B.	II	1908	D
Reynolds, Hiram L.	III	1901	E
Reynolds, Isabel H.	III-V	1903	D
Reynolds, Isabel H.	P. G. III-V	1906	D
Rhodes, Joseph E.	V	1904	E
Richards, Francis G.	IIa	1906	E
Ritter, Alfred E.	IIb	1907	E
Robbins, John	IIb	1907	E
Roberson, Pat H.	I	1905	D
Roberts, Carrie I.	IIIb	1905	D
Robinson, Ernest W.	IV	1908	D
Robinson, Thomas	I	1909	E
Robinson, William C.	III-V	1903	D
Rockwell, Henry D.	IIa	1903	E
Rockwell, Samuel F.	IIa	1902	E
Rooney, George W.	I	1904	E
*Rowell, Herman C.	I-IIb	1900	E
Rushworth, Walter	VI	1906	E
Ryan, Edward P.	I	1909	E
Saalfrank, Joseph C.	III	1908	E
Saunders, Edward B.	III	1901	E
Saunders, Harold F.	IV	1909	D
Scally, Edward	VI	1908	E
Scanlon, Edward J.	IIb	1901	E
Schermerhorn, George E.	I	1902	E
Schermerhorn, George E.	Va	1908	E
Schofield, John S.	III	1903	E
Schoon, Fenton	IIb	1903	E
Schubert, George J.	V	1906	E
Schubert, George J.	III	1909	E
Schuerfeld, Harry W.	III	1909	E
Schuster, William F.	VII	1908	E
Seddon, N. Graham	III	1908	E
Semple, Alexander	III	1908	E
Senior, George	Va	1906	E
Senior, George	I-Vc	1907	E
Shackelton, John H.	IV	1908	E
Shannon, Philip J.	V	1901	E
Sharpe, John R.	VI	1906	E
Shaw, James	V	1904	E
Sheppard, Byron H.	VI	1906	E
Silcox, Arthur E.	I	1900	E
Silk, Frederick C. M.	IV	1905	E
Silk, Patrick E.	VII	1906	E
Simola, Emil J.	IIa-b	1905	E
Simoneau, Verner W.	VI	1908	E
Skinner, Clarence W.	III	1905	E
Skinner, Clarence W.	P. G. III	1906	E
Skinner, Clarence W.	VII	1907	E
Sleeper, Robert R.	IV	1900	D
*Smith, Albert A.	I	1899	D
Smith, Arthur	III	1905	E
Smith, Arthur	P. G. III	1906	E
Smith, Arthur	Va	1906	E

*Deceased

Name	Course	Class	Day or Evening
Smith, Arthur	Vc	1907	E
Smith, Arthur	P. G. III	1909	E
Smith, Edward	I	1904	E
Smith, Ernest B.	Vb	1907	E
Smith, Fred	IIb	1901	E
Smith, George A.	III	1905	E
Smith, George A.	P. G. III	1906	E
Smith, George A.	VII	1909	E
Smith, James	Vb	1907	E
Smith, John W.	IIb	1904	E
Smith, Percy H.	Vb	1907	E
Smith, Ralston F.	I	1904	D
Smith, Stephen E.	I	1900	D
Smith, William E.	III	1905	E
Smith, William E.	P. G. III	1906	E
Smith, William E.	VII	1907	E
Smith, William E.	P. G. III	1909	E
Smith, William H.	IIb	1902	E
Snelling, Fred N.	II	1903	D
Snow, Fred L.	IV	1900	E
Spedding, Ephraim H.	III	1899	E
Spiegel, Edward	V	1903	D
Spurr, Albert R.	VII	1908	E
Spurr, James H., Jr.	IV	1908	E
Sterling, Walter	III	1904	E
Stevens, Dexter	I	1904	D
Stevens, Frank W.	VI	1905	E
Stevenson, Murray R.	III-V	1903	D
Stevenson, William	II	1899	E
Stevenson, William	III	1902	E
Stewart, Arthur A.	II	1900	D
Stewart, Charles	Va	1908	E
Stewart, Walter L.	III	1903	D
Stockham, Burton I.	IV	1903	E
Stockham, Burton I.	P. G. IV	1904	E
Stocks, Carl W.	VIa	1909	E
Stohn, Alexander C.	III-V	1906	D
Stone, Ira A.	IV	1909	D
Stopherd, William H.	II-V	1899	E
Stopherd, William H.	VI	1902	E
Stopherd, William H.	III	1905	E
Stopherd, William H.	P. G. III	1906	E
Stopherd, William H.	P. G. III	1909	E
Storer, Francis E.	II	1907	D
Stursberg, Paul W.	II	1907	D
Sullivan, Humphrey F.	I	1909	E
Swan, Guy C.	II	1906	D
Swift, Edward S.	V	1899	E
Swift, Edward S.	I	1901	E
Swift, Edward S.	I	1902	D
Sykes, Alvin E.	VIa	1909	E
Syme, James F.	II	1900	D
Tarpey, John F.	IIa	1904	E
Teichmann, Alfred A.	Vb	1908	E
Thomas, Roland V.	I	1905	D

Name	Course	Class	Day or Evening
Thompson, Charles B.	VI	1904	E
Thompson, Everett L.	I	1905	D
Thompson, Henry J.	IV	1900	D
Tilton, Elliott T.	II	1899	D
Tonge, John	IV	1905	E
Tonge, Matthew	III	1903	E
Toovey, Sidney E.	V	1904	D
Tucker, John T.	I	1908	E
Tucker, John T.	Va	1909	E
Umpleby, Thomas B.	V	1902	E
Upton, Frank A.	I	1903	E
Varney, Manley H.	III	1902	E
Varney, Manley H.	I	1903	E
Varnum, Arthur C.	II	1906	D
Varnum, Arthur C.	Vb	1907	E
Varnum, Arthur C.	P. G. III	1908	E
Varnum, Arthur C.	VII	1909	E
Vogt, Alfred H.	III	1902	E
Vogt, Alfred H.	IIb	1909	E
Vogt, Harry A.	Vb	1906	E
Walker, Anna G. (See Pradel)			
Walker, David	III	1902	E
Walker, David	P. G. III	1903	E
Walker, William, Jr.	VII	1906	E
Walsh, Michael L.	I	1909	E
Ward, James J.	VII	1906	E
Wardrobe, William L.	I	1900	E
Ware, Edward W.	III	1909	E
Warren, Philip H.	II	1905	D
Waterhouse, Joseph	IV	1900	E
Waterworth, Frank W.	Vb	1907	E
Watson, Luther F.	IIb	1909	E
Webb, Francis H.	V	1904	E
Webb, Francis H.	III	1907	E
Webb, Frank H.	IV	1904	D
Webber, Arthur H.	IV	1901	D
Webber, John F.	III	1907	E
Webber, John F.	P. G. III	1908	E
Weigel, Frederick A.	Vlb	1909	E
Weinz, W. Elliot	IV	1908	D
Wesson, Paul B.	I	1901	E
Wahlberg, Einar S.	I	1907	E
Wheelock, Stanley H.	II	1905	D
*Whitcomb, Harry E.	I	1906	E
White, Royal P.	II	1904	D
Whitehead, Bennett	IIb	1901	E
Whittaker, Thomas	IIb	1907	E
Whittaker, Thomas	IIb	1908	E
Wiggin, Leon M.	III	1907	E
Wiggin, Leon M.	P. G. III	1908	E
Wightman, William H.	IV	1906	D
Wilde, Thomas E.	IIa	1905	E
Willey, Frank S.	I	1901	E
Willgeroth, Henry J.	III	1908	E

*Deceased

Name	Course	Class	Day or Evening
Williamson, Isaac F.	IV	1901	E
Wilmot, Joseph	III	1908	E
Wilmot, William	III	1899	E
Wilson, Calvin E.	IIb	1902	E
Wilson, George H.	IIb	1902	E
Wilson, John S.	II	1903	D
Wilson, Walter E. H.	I	1904	D
Wilton, George H.	III	1899	E
Wing, Charles T.	III	1900	E
Wing, Charles T.	III	1902	D
Wingate, William H.	IV	1908	D
Wise, Paul T.	II	1901	D
Wiswall, Frank T.	V	1905	E
Wolf, William C.	Va	1907	E
Wolf, William C.	Vb	1908	E
Wolger, John J.	III	1907	E
Wood, Herbert C.	I	1906	D
Wood, J. Carleton	IV	1909	D
Wood, Jonathan	I	1902	E
Wood, Jonathan	Va	1908	E
Woodbury, W. Sanford	I	1900	E
Woodcock, Eugene C.	II	1907	D
Woodies, Ida A.	IIIb	1900	D
Woodies, Ida A.	P. G. IIIb	1901	D
Woodman, Harry L.	I-III-V	1902	D
Woodruff, Charles B.	V	1906	D
Wright, Edward, Jr.	II	1905	D
Yare, John F.	Vb	1907	E
Young, Richard, Jr.	Va	1908	E
Young, Richard, Jr.	Vc	1909	E

REGISTER OF GRADUATES

(C) Indicates Certificate, Partial Course.

(D) Indicates Diploma, Complete Course.

(P. G.) Indicates Post Graduate Course.

(x) Indicates Last Known Address.

(*) Deceased.

Day Course, 1899

Name	Course	Occupation
Bailey, Joseph W.	I D	Principal, Bradford-Durfee Textile School, Fall River, Mass.
Burrage, Katherine C.	IIIb C	Teacher, Evening Drawing School, Lowell Mass.
Cuttle, James H.	II D	Designer, William Whitman and Company, New York City.
Fels, August B.	II D	Yarn Salesman, New England Cotton Yarn Co., New York City.
Harmon, Charles F.	I D	In business, Lowell, Mass.
*Smith, Albert A.	I D	
Tilton, Elliott T.	II D	Electrician, General Electric Co., Boston, Mass.

Evening Course, 1899

*Berry, Frank M.	III C	
Binns, Heaton	II-V C	Foreman, Worsted Department, Shuttleworth Bros. Co., Amsterdam, N. Y.
xBroadbent, James T.	I C	In Converting House, New York City.
xCollier, John	III C	Superintendent, American Woolen Company, No. Vassalboro, Me.
Crompton, Henry H.	II C	Instructor, French Spinning, Lowell Textile School, Lowell, Mass.
Gaunt, Alfred C.	III C	Treasurer and Manager, Tremont Worsted Co., Methuen, Mass.
Kellett, Irvine	II C	Second Hand Worsted Spinning, Lower Pacific Mills, Lawrence, Mass.
xMarjerison, Isaiah D.	II C	Overseer Top Mill, Arlington Mills, Lawrence, Mass.
xMcAlister, John W.	V C	In Real Estate business, Winston-Salem, N. C.
Moir, Alexander L.	III C	Letter Carrier, Lowell, Mass.
xNoble, John T.	V C	With Amoskeag Mfg. Co., Manchester, N. H.
Nugent, Thomas A.	II-V C	Amsterdam, N. Y.
Spedding, Ephraim H.	III C	Second Hand Weaving, Tremont and Suffolk Mills, Lowell, Mass.
xStevenson, Wm.	II C	Supt. Franklin Woolen Mills, Franklin, Ky.
Stopherd, William H.	II-V C	Overseer Worsted Spinning, Bigelow Carpet Co., Lowell, Mass.

Name	Course	Occupation
Swift, Edward S.	V C	Novice of the Society of Jesus, St. Andrew-on-Hudson, Poughkeepsie, N. Y.
Wilmot, William	III C	Designer, Hamilton Webb Co., Hamilton, R. I.
xWilton, George H.	III C	Overseer, M. T. Stevens and Sons Company, No. Andover, Mass.

Day Course, 1900

Baldwin, Arthur L.	IV D	Chemist, Lowell, Mass.
Barr, I. Walwin	I D	Styler, Renfrew Mfg. Co., New York City.
Bodwell, Henry A.	II D	Supt., Smith and Dove Mfg. Co., Andover, Mass.
Brickett, Chauncey J.	II D	Principal, School of Textiles, International Correspondence School, Scranton, Pa.
Burrage, Katherine C. P. G.	IIIb C	See Day Course, 1899.
Campbell, Laura E.	IIIb C	Designer, Lowell, Mass.
xHarrison, Mrs. Amy H. (Goodhue)	IIIb C	Dracut, Mass.
Lakeman, Fannie S.	IIIb C	Designer, Salem, Mass.
Lamson, George F.	I D	Draftsman, Chas. T. Main, Boston, Mass.
xLeach, John P.	I-V C	Foreman, Harriet Cotton Mills, Henderson, N. C.
Merchant, Edith C.	IIIb C	Designer, Lowell, Mass.
Parker, Harry C.	V C	Franklin, N. H.
Perkins, John E.	III D	Asst. Supt., S. N. and C. Russell Mfg. Co., Pittsfield, Mass.
Pradel, Alois J.	III D	Designer and Asst. Supt., Montrose Mills, Woonsocket, R. I.
Sleeper, Robert R.	IV D	Instructor in Dyeing, Lowell Textile School, Lowell, Mass.
Smith, Stephen E.	I D	Head instructor, Cotton Department, Lowell Textile School, Lowell, Mass.
Stewart, Arthur A.	II D	Head Instructor, Finishing, Lowell Textile School, Lowell, Mass.
Syme, James F.	II D	Agent, Saxonville Mills, Saxonville, Mass.
Thompson, Henry J.	IV D	Dyer, Boston Rubber Shoe Co., Malden, Mass.
Woodies, Ida A.	IIIb C	Designer, Boston, Mass.

Evening Course, 1900

Campbell, Albert D.	IIb C	Section Hand, Arlington Mills, Lawrence, Mass.
xCawthra, Albert B.	IIb C	Overseer, Moore Spinning Company, No. Chelmsford, Mass.
Colby, Arthur D.	I C	Draughtsman, Lowell Machine Shop, Lowell, Mass.
Donnelly, James	I C	Overseer, Mule Spinning, Stark Mills, Manchester, N. H.
Elston, Fred R.	III C	Asst. Supt. and Designer, Shackamaxon Worsted Co., Philadelphia, Pa.
Howard, John	V C	Overseer, Weaving, Masconia Mill, Lebanon, N. H.

Name	Course	Occupation
Hutton, Clarence	V C	Circulation Manager, Lord and Nagle Co., Boston, Mass.
Jones, William J.	IIb C	Overseer, Worsted Spinning, U. S. Bunting Co., Lowell, Mass.
Maden, Harry	IIb C	North Adams, Mass.
Nelson, Ernest H.	IIb C	Designer, Merrimack Mfg. Co., Lowell, Mass.
Ogley, Samuel A.	IIb C	Overseer, Worsted Spinning, Brookside Worsted Mills, North Chelmsford, Mass.
xOsgood, Charles	I C	Draftsman, General Electric Company, Lynn, Mass.
*Rowell, Herman C.	I-IIb C	
Silcox, Arthur E.	I C	Draftsman, Lowell Machine Shop, Lowell, Mass.
xSnow, Fred L.	IV C	Overseer, Dyeing and Bleaching, Lawrence Mfg. Co., Lowell, Mass.
Wardrobe, Wm. L.	I C	Ware, Mass.
xWaterhouse, Joseph	IV C	Section Hand, Merrimack Mfg. Company, Lowell, Mass.
Wing, Charles T.	III C	Designer, Middlesex Mfg. Company, Lowell, Mass.
xWoodbury, W. Sanford	I C	Overseer Carding, Orswell Mills, Fitchburg, Mass.

Day Course, 1901

Bradley, Richard H.	V C	Loomfixer, Barnaby Mfg. Company, Fall River, Mass.
Buchan, Donald C.	II D	Asst. Supt., Stevens Mills, North Andover, Mass.
Currier, John A.	II D	Supt., Stevens and Sons Co., Haverhill, Mass.
xEwer, Nathaniel T.	IV D	Chemist, American Dyewood Co., Chester, Pa.
Foster, Clifford E.	II D	Asst. Supt. Champlain Silk Mills, Whitehall, N. Y.
xHarrison, Mrs. Amy H. P.G. (Goodhue)	IIIb C	See Day, 1900.
Kingsbury, Percy F.	IV D	Overseer, Color Dept., Merrimack Mfg. Co., Lowell, Mass.
Marinel, Walter N.	I D	Engineer, Old Colony Broken Stone Co., Braintree, Mass.
Minge, Jackson C.	I-V C	Treasurer, Minge Mfg. Company, Demopolis, Ala.
Moorhouse, William R.	IV D	Chemist, Cassella Color Co., Boston, Mass.
Parker, B. Moore	I D	Instuctor, Carding and Spinning, A. and M. College, West Raleigh, N. C.
Webber, Arthur H.	IV D	Chemist, F. E. Atteaux and Co., Boston, Mass.
Wise, Paul T.	II D	Agent, Bigelow Carpet Co., Clinton, Mass.
Woodies, Ida A.	P. G. IIIb C	See Day, 1900.

Evening Course, 1901

Name	Course	Occupation
xAspinwall, William	IIb C	Philadelphia, Pa.
*Berry, Frank M.	V C	
xBrooks, Noah	III-V C	Lowell, Mass.
xBurghardt, Paul C.	IIa C	Second Hand, Card Room, Merrimack Woolen Co., Lowell, Mass.
Buzzell, William O.	III C	Second Hand, Weaving, Bristol Mfg. Co., New Bedford, Mass.
Cheetham, John James	III C	Spindle Setter, Mass. Cotton Mills, Lowell, Mass.
Chippindale, Ernest W.	IIb C	Section Hand, Moore Spinning Company, No. Chelmsford, Mass.
Cowdell, Herbert	V C	Loomfixer, Hamilton Mfg. Co., Lowell, Mass.
xDavis, Henry	IIb C	Overseer, Carding, Moore Spinning Company, No. Chelmsford, Mass.
xDonovan, Daniel F.	IIa C	Second Hand, Woolen Carding, Yonkers, N. Y.
Evison, William A.	V C	Loomfixer, Mass. Cotton Mills, Lowell, Mass.
Farrell, Thomas	IIa C	Woolen Spinner, Stirling Mills, Lowell, Mass.
Frame, William C.	V C	Overseer, Johnson & Johnson, New Brunswick, N. J.
Gagan, John H.	V C	Overseer, Stirling Mills, Lowell, Mass.
Grant, Archibald	IIb C	Section Hand, Spinning, Bigelow Carpet Co., Lowell, Mass.
Grouke, Michael	IIb C	Overseer, Drawing, Bigelow Carpet Company, Lowell, Mass.
xHill, Daniel	IIb C	With Maine Alpaca Co., Springvale, Me.
Hitchcock, Thomas B.	I-IIa-III C	With Consolidated Cotton Duck Company, New York City.
Holgate, Charles H.	IIa C	Manager, Selmar Hess, New York City.
xHunter, Ralph	III C	Salesman, Hall, Hartwell and Company, Troy, N. Y.
Jones, William J.	IIa C	See Evening, 1900.
Killerby, Walter	IIb C	Overseer, Park Worsted Mill, Lowell, Mass.
Law, Alfred	IIb C	Section Hand, Arlington Mills, Lawrence, Mass.
Lord, Wilfred	III C	Inspector, Textile Fabrics, U. S. Government, Boston, Mass.
McQuade, Hugh B.	V C	Loomfixer, Bigelow Carpet Company, Lowell, Mass.
Minge, Jackson C.	III C	See Day, 1901.
xMorris, Frank A.	V C	Loomfixer, Lowell, Mass.
Nelson, Ernest H.	IIa C	See Evening, 1900.
Noble, John T.	III C	See Evening, 1899.
xPeel, Hudson	IIb C	Methuen, Mass.
Reynolds, Hiram L.	III C	Agent, Saunders Cotton Mills, Saundersville, Mass.
xSaunders, Edward B.	III C	In business, Fall River, Mass.
xScanlon, Edward J.	IIb C	In business, Lawrence, Mass.
Shannon, Philip J.	V C	Loomfixer, American Woolen Co., Lebanon, N. H.

Name	Course	Occupation
Smith, Fred	IIb C	Supt., Yarn Dept., Wood Worsted Mills, Lawrence, Mass.
Swift, Edward S.	I C	See Evening, 1899.
Wesson, Paul B.	I C	Foreman Machinist, Lowell Machine Shop, Lowell, Mass.
Whitehead, Bennett	IIb C	Overseer, Wood Worsted Mill, Lawrence, Mass.
Wiley, Frank S.	I C	Second Hand, Picking and Carding, Pacific Mills, Lawrence, Mass.
Williamson, Isaac F.	IV C	Boss Dyer, Hamilton Mfg. Co., Lowell, Mass.

Day Course, 1902

Burnham, Frank E.	IV D	Chemist, Avery Chemical Co., Boston, Mass.
Carter, Robert A.	IV D	Chemist and Salesman, Roessler & Hasslacher Chemical Company, New York City.
Craig, Clarence E.	III D	With Kansas City Cotton Mills Co., Kansas City, Kans.
Curran, Charles E.	II-III-V C	Head Designer, Wood Worsted Mills, Lawrence, Mass.
Ferguson, Arthur F.	I C	Instructor, Design Dept., Lowell Textile School, Lowell, Mass.
Harris, George S.	I C	Agent, Lanett Cotton Mills, West Point, Ga.
Haskell, Walter F.	IV D	Overseer of Dyeing, Dana Warp Mills, Westbrook, Me.
Holgate, Benjamin	III C	Cost Accountant, Boott Mills, Lowell, Mass.
Ramsdell, Theodore E.	I D	Agent, Monument Mills, Housatonic, Mass.
Swift, Edward S.	I D	See Evening, 1899.
Wing, Charles T.	III D	See Evening, 1900.
Woodman, Harry L.	I-III-V C	Installer, Barber, Coleman Co., Boston, Mass.

Evening Course, 1902

xAdams, Wm. R.	IIa C	Pressman, Stevens Mills, No. Andover, Mass.
xBarlow, Robert	V C	Clerk, Lowell, Mass.
Binns, Heaton	VI C	See Evening, 1899.
Bowring, George P. B.	VI C	Machinist, Lowell Machine Shop, Lowell, Mass.
xBrainerd, Irving L.	I C	Overseer, Carding, W. L. Barrell and Co., Lawrence Mass.
xBurghardt, Edward S.	IIa C	Lawrence, Mass.
Buzzell, Wm. O.	P. G. III C	See Evening, 1901.
Cheetham, John James	P. G. III C	See Evening, 1901.
Collier, John	P. G. III C	See Evening, 1899.
Cowdrey, Charles E.	V C	Overseer, Talbot Mills, No. Billerica, Mass.

Name	Course	Occupation
xCremin, Daniel J.	I C	Second Hand, Boott Mills, Lowell, Mass.
xDonnellan, Frank T.	IIa C	Lowell, Mass.
xDudley, George E.	I C	Third Hand, Carding, Mass. Mills, Lowell, Mass.
Ferguson, Thomas	V C	Second Hand, Appleton Co., Lowell, Mass.
xField, Charles W.	VI C	Draftsman, C. F. Morrill, Somerville, Mass.
xForrest, Fred G.	IIa C	Finishing Room, Middlesex Co., Lowell, Mass.
xFortune, David A.	IIb C	Second Hand, Worsted Spinning, Lower Pacific Mills, Lawrence, Mass.
Gaunt, Alfred C.	P. G. III C	See Evening, 1899.
xGood, Henry	I C	Providence, R. I.
xHaigh, Walter	III C	U. S. Bunting Co., Lowell, Mass.
xHaworth, Joseph	VI C	Traveling Machinist, C. G. Sargent's Sons Corp., Granitville, Mass.
xHogan, James A.	V C	Lowell, Mass.
xHoyle, Edward	IIb C	Asst. Supt., Moore Spinning Co., North Chelmsford, Mass.
xJohnson, Ernest A.	IIa-b C	Asst. Supt., Washington Mills, Lawrence, Mass.
xKelley, Michael H.	I C	Second Hand, Appleton Co., Lowell, Mass.
Kent, Ernest J.	IIb C	Section Hand, English Drawing, Lower Pacific Mills, Lawrence, Mass.
Lamont, Walter M.	IIb C	Agent, Wood Worsted Mill, Lawrence, Mass.
xLawliss, Augustine J.	V C	Overseer Weaving, Belvidere Woolen Co., Lowell, Mass.
Lee, Charles	I C	Machinist, Lowell Machine Shop, Lowell, Mass.
Leith, Edwin E.	III C	Asst. Supt., Thos. Kent Mfg. Co., Clifton Heights, Pa.
Libby, C. Robert	VI C	Draftsman-Designer, Lamson Consolidated Store Service Co., Lowell, Mass.
Molloy, Andrew	V C	Overseer of Dressing, Tremont and Suffolk Mills, Lowell, Mass.
Nugent, Thomas A.	VI C	See Evening, 1899.
Osgood, Charles F.	VI C	See Evening, 1900.
Potter, Richard W.	V C	Second Hand Weaving, Mass. Cotton Mills, Lowell, Mass.
xRockwell, Samuel F.	IIa C	Supt. Mule Dept., Davis and Furber Machine Co., No. Andover, Mass.
Schermerhorn, George E.	I C	Overseer, Boott Mills, Lowell, Mass.
Smith, Wm. H.	IIb C	Stamp Clerk, Postoffice, Lawrence, Mass.
Stevenson, William	III C	See Evening, 1899.
Stopherd, Wm. H.	VI C	See Evening, 1899.
Umpleby, Thomas B.	V C	Supt., J. A. Humphrey and Son, Ltd., Moncton, N. B.
xVarney, Manley H.	III C	Overseer, Finishing Dept., Amoskeag Mfg. Co., Manchester, N. H.
xVogt, Alfred H.	III C	Designing Room, George E. Kunhardt, Lawrence, Mass.
xWalker, David	III C	Overseer, Burlington Mills, Winooski, Vt.
xWilson, Calvin E.	IIb C	Overseer, Twisting, Cranston Worsted Mills, Bristol, R. I.
Wilson, George H.	IIb C	Section Hand, Lower Pacific Mills, Lawrence, Mass.
Wood, Jonathan	I C	Overseer, Boott Mills, Lowell, Mass.

Day Course, 1903

Name	Course	Occupation
Bennett, Edward H.	V C	Bus. Mgr., F. P. Bennett and Co., New York City.
xBloom, Wilfred N.	IV D	Asst. Mgr., Read, Holliday and Sons, Ltd., New York City.
Campbell, Louise P.	IIIb C	Designer, Lowell, Mass.
Campbell, Orison S.	II D	Asst. Supt., American Felt Co., Dolgeville, N. Y.
Chamberlin, Frederick E.	I D	With Monument Mills, Housatonic, Mass.
Emerson, Frank W.	II D	Supt., Moosup Mills, Moosup, Conn.
xEvans, Alfred W.	III D	Arlington Mills, Lawrence, Mass.
xEvans, William R.	III D	Bradford, Mass.
Ferguson, Arthur F.	I D	See Day, 1902.
xFuller, George	I D	Designer, Arnold Print Works, No. Adams, Mass.
Gerrish, Walter	III D	With Allen Lane Co., Boston, Mass.
Holgate, Benj.	V C	See Day, 1902.
Hutton, Clarence	III C	See Evening, 1900.
Morrison, Fred C.	I D	Clerk, Levi W. Phelps, Ayer, Mass.
Najarian, Garabed	IV D	Overseer of Dyeing, Monument Mills, Housatonic, Mass.
Petty, George E.	I-V C	In business, Greensboro, N. C.
Pradel, Mrs. A. J. (Walker)	IIIb C	Woonsocket, R. I.
*Rasche, Wm. A.	III D	
Reynolds, Isabel H.	III-V C	Clerk, Arlington Mills, Lawrence, Mass.
xRobinson, Wm. C.	III-V C	With Russell Mfg. Co., Middletown, Conn.
Snelling, Fred N.	II D	With American Express Co., Haverhill, Mass.
xSpiegel, Edward	V C	In business, New York City.
Stevenson, Murray R.	III-V C	Draftsman, City Hall, Pasadena, Cal.
xStewart, Walter L.	III D	Designer, Clarence Whitman and Company, New York City.
xWilson, John S.	II D	With H. Banendahl & Co., New York City.

Evening Course, 1903

Adams, Henry S.	IIa C	Purchasing Agent, Bates Mfg. Co., Lewiston, Me.
Balmforth, James H.	IIa C	Clerk, P. O., Bloomfield, N. J.
Barry, Edward J.	III C	Overseer, Weaving, Jackson Mfg. Company, Nashua, N. H.
Bastow, Henry	III C	Warp Dresser, Arlington Mills, Lawrence, Mass.
xBaxter, Alvah J.	IIa C	Bookkeeper, Assabet Mills, Maynard, Mass.
Byam, Walter S.	VI C	Draftsman, Lowell Machine Shop, Lowell, Mass.
xCady, Dennis J.	V C	Section Hand, Washington Mills, Lawrence, Mass.
Donnellan, Frank T.	V C	See Evening, 1902.
Flynn, John J.	VI C	Bookkeeper, Coffey Bros., Lowell, Mass.
French, Mrs. Martha B. (Balmforth)	III C	Tewksbury, Mass.

Name	Course	Occupation
Garner, William	III C	Foreman of Refinery, Warren Bros. Co., Washington, D. C.
Gaunt, Alfred C.	IIa C	See Evening, 1899.
Goodchild, George	I C	Draftsman, Lowell Machine Shop, Lowell, Mass.
Gray, Finley M.	VI C	With Merrimack Mfg. Co., Lowell, Mass.
xHiggins, James A.	IIa C	Spinner, Talbot Mills, No. Billerica, Mass.
Howard, John	III C	See Evening, 1900.
Hunter, Ralph	V C	See Evening, 1901.
Jennings, James J.	III C	Designer, Lyman Mills Co., Holyoke, Mass.
Johnson, Samuel L.	V C	Second Hand Weaving, Arlington Mills, Lawrence, Mass.
Keleher, John J.	IIb C	Overseer, Drawing Dept., Prospect Mill, Lawrence, Mass.
Knowles, Frank E.	I C	Overseer, Tremont and Suffolk Mills, Lowell, Mass.
xLawrence, Charles	I C	Overseer Mule Spinning, Dartmouth Corp., New Bedford, Mass.
Leach, Joseph W.	V C	Designer, Pacific Mills, Lawrence, Mass.
Lincourt, Hector L.	VI C	New York City.
Lord, Wilfred	IIb C	See Evening, 1901.
Mason, Frederick A.	I C	Mule Spinner, Saxony Worsted Mills, Newton, Mass.
Moir, Alexander L.	P. G. III C	See Evening, 1899.
Mortenson, Carl W.	III C	Clerk, Talbot Mills, No. Billerica, Mass.
*Mozley, Arthur	VI C	
Myers, James W.	III-IV C	Clerk, U. S. Bunting Co., Lowell, Mass.
Nicholson, Richard	IIb C	Section Hand, Washington Mills, Lawrence, Mass.
xNoonan, Denis T.	III C	Asst. Supt., Knoxville Woolen Mills, Knoxville, Tenn.
xPalmer, G. Buel	III C	Musketaquid Mills, Lowell, Mass.
xRockwell, Henry D.	IIa C	Clerk, Davis and Furber Machine Co., No. Andover, Mass.
xSchofield, John S.	III C	Asst. Supt. and Designer, Lawrence Keegan Mill, Wilsonville, Conn.
Schoon, Fenton	IIb C	Section Hand, Worsted Drawing, Pacific Mills, Lawrence, Mass.
Stokham, Burton I.	IV C	Chemist, Bigelow Carpet Company, Lowell, Mass.
xTonge, Matthew	III C	Weaver, Dartmouth Mfg. Co., New Bedford, Mass.
xUpton, Frank A.	I C	Overseer, Carding, I. E. Palmer Co., Middletown, Conn.
Varney, Manley H.	I C	See Evening, 1902.
Walker, David	P. G. III C	See Evening, 1902.

Day Course, 1904

Abbott, Edward M.	II D	Clerk, Abbott Worsted Co., Graniteville, Mass.
Baldwin, Frederick A.	II D	With Walter Blue and Company, Ltd., Sherbrooke, P. Q., Canada.
Clapp, F. Austin	II D	Salesman, S. Herbert Golden Co., New York City.

Name	Course	Occupation
Clogston, Raymond B.	IV D	Dyer, Arnold Print Works, No. Adams, Mass.
Culver, Ralph F.	IV D	Supt. Holliston Mills, Norwood, Mass.
xCutler, Benj. W., Jr.	III D	With W. H. Hinchman and Co., New York City.
Dewey, James F.	II D	Supt., Dewey's Mills, Quechee, Vt.
xDonald, Albert E.	II D	With Atlas Linen Co., Meredith, N. H.
xHalsell, Elam R.	I C	With Appleton Mills, Lowell, Mass.
xHorsfall, George G.	II-III-V C	Asst. Designer, Martinsburg Worsted and Cassimere Co., Martinsburg, W. Va.
Jones, Everett A.	II C	Supt., Nye and Wait Carpet Co., Auburn N. Y.
xJury, Alfred E.	IV D	Chemist, Wells and Richardson Company, Burlington, Vt.
Lucey, Edmund A.	II D	Saylesville Bleachery, Saylesville, R. I.
MacPherson, Wallace A.	III D	Assistant to Supt., Ray Mills, Franklin, Mass.
Meadows, Wm. R.	I D	Director, Miss. Textile School, Agricultural College, Miss.
xO'Donnell, John D.	I C	Clerk, Travers Bros. Co., New York City.
O'Hara, Wm. F.	IV C	Chemist, Arthur Merritt, Boston, Mass.
Parker, Everett N.	I C	With Parker Spool and Bobbin Company, Lewiston, Me.
Smith, Ralston F.	I C	Secretary and Treasurer, Davies Printing Co., Cleveland, Ohio.
Stevens, Dexter	I D	Supt. of Yarn Dept., Lancaster Mills, Clinton, Mass.
Toovey, Sidney E.	V C	Pattern Dresser & Weaver, Talbot Mills, No. Billerica, Mass.
Webb, Frank H.	IV D	Chemist, American Woolen Co., Lawrence, Mass.
White, Royal P.	II D	Supt., Stirling Mills, Lowell, Mass.
Wilson, Walter E. H.	I C	Machinist, D. H. Wilson and Co., Lowell, Mass.

Evening Course, 1904

Adams, Michael E.	VI C	Lowell, Mass.
Balmforth, James H.	IIa-b C	See Evening, 1903.
xBalmforth, Wm. F.	VI C	No. Billerica, Mass.
xBarker, John P.	V C	Peacedale, R. I.
Barrington, John A.	IV C	With Kalle and Co., Boston, Mass.
xBoucher, John L.	VI C	Lowell, Mass.
xButler, Benj. O.	VI C	Lowell, Mass.
xCallahan, Patrick A.	VI C	With Lower Pacific Mills, Lawrence, Mass.
xCheetham, John Joseph	I C	Carder, Lowell, Mass.
xConley, Frederick A.	VI C	Machinist, Kitson Machine Co., Lowell, Mass.
Connors, Edward F.	VI C	Draftsman, Locks and Canals, Lowell, Mass.
Davis, Prentice T.	I C	Second Hand, Lawrence Mfg. Co., Lowell, Mass.
Delmage, Edward R.	III C	Overseer Weaving, Thos. Kent Mfg. Co., Clifton Heights, Pa.

Name	Course	Occupation
xDempsey, John W.	IIa C	Spinner, Bigelow Carpet Co., Lowell, Mass.
xDonahue, Michael F.	VI C	Boston, Mass.
xDoole, George L.	VI C	Weaver, U. S. Bunting Co., Lowell, Mass.
Dooley, Edward W.	VI C	With Spencer and Co., Lowell, Mass.
Duggan, Francis P.	VI C	Second Hand, U. S. Cartridge Co., Lowell, Mass.
Frank, Emil M.	III C	Asst. Designer, Arlington Mills, Lawrence, Mass.
Gaunt, Alfred C.	IIb C	See Evening, 1899.
Hempel, Frank	V C	Room Hand, Washington Mills, Lawrence, Mass.
Higgins, James A.	IIa-b C	See Evening, 1903
xHoyle, Joseph	IIb C	Overseer, Drawing, Moore Spinning Co., No. Chelmsford, Mass.
Jeannotte, Arthur	VI C	With Heinze Electric Co., Lowell, Mass.
xKershaw, Wm. E.	V C	Weaver, Talbot Mills, No. Billerica, Mass.
Langevin, Felix D.	VI C	Asst. Supt., Kitson Machine Shop, Lowell, Mass.
xLord, Harry D.	III C	Lowell, Mass.
Lord, Wilfred	IIa C	See Evening, 1901.
xMcBride, Robert G.	IIa C	Mule fixer, Merrimack Woolen Mills, Lowell, Mass.
Merrill, Edwin C.	VI C	Draftsman, Eng. Dept., City Hall, Lawrence, Mass.
Miller, Emil H.	V C	Charge of Supply Dept., Lower Pacific Mills, Lawrence, Mass.
Moorehouse, Thomas	VI C	Electrician, Wood Worsted Mills, Lawrence, Mass.
Murphy, John H.	VI C	Clerk, Supply Dept., City Hall, Lowell, Mass.
Notman, Frederick W.	I C	Clerk, Mass. Cotton Mills, Boston, Mass.
xPatrick, Alexander	III C	Omaha, Neb.
Redman, Henry S.	III C	Asst. Supt., Appleton Co., Lowell, Mass.
xReed, Foster C. K.	VI C	Steam Engineer, Farwell Bleachery, Lawrence, Mass.
Rhodes, Joseph E.	V C	Wire Sharpener, Mass. Mohair Plush Co., Lowell, Mass.
Rooney, George W.	I C	Overseer, N. H. Spinning Mill, Penacook, N. H.
xShaw, James	V C	Loomfixer, Lowell, Mass.
Smith, Edward	I C	Overseer Carding, Boott Mills, Lowell, Mass.
xSmith, John W.	IIb C	Section Hand, Arlington Mills, Lawrence, Mass.
xSterling, Walter	III C	New Bedford, Mass.
Stokham, Burton I.	P. G. IV C	See Evening, 1903.
xTarpey, John F.	IIa C	With Merrimack Mfg. Co., Lowell, Mass.
Thompson, Charles B.	VI C	Clerk, B. and M. Railroad, Lowell, Mass.
xWebb, Francis H.	V C	Quiller, Mass. Mohair Plush Co., Lowell, Mass.

Day Course, 1905

Name	Course	Occupation
Adams, Henry S.	I D	See Evening, 1903.
Arundale, Henry B.	II-III-V C	Instructor, Lawrence Industrial School, Lawrence, Mass.
Boyd, George A.	I D	Treasurer's Office, Harmony Mills, Boston, Mass.
Carr, George E.	I D	Foreman, Mending Dept., Wyoming Valley Lace Mills, Wilkesbarre, Pa.
Cole, James T.	II D	Manager, Industrial Dept., Mass. Commission for Adult Blind, Cambridge, Mass.
Conklin, Jennie G.	IIIb C	Commercial Designer, Boston, Mass.
Curtis, Wm. L.	II C	Of Jackson & Co., Boston, Mass.
xDillon, James H.	III D	With Walworth Bros., Boston, Mass.
Harris, Charles E.	I D	Of C. E. Harris Co., Easthampton, Mass.
Hollings, James L.	I D	Supt. of Webbing, A. Zeigler and Sons Co., Roxbury, Mass.
Hook, Russell W.	IV D	West Medford, Mass.
Hunt, Chester L.	III C	Sample Dresser, Peacedale Mfg. Company, Peacedale, R. I.
Jones, Everett A.	III D	See Day, 1904.
Lee, Wm. H.	V C	Overseer, Farr Alpaca Company, Holyoke, Mass.
Lewis, Walter S.	IV D	Asst. Physicist, Bureau of Standards, Washington, D. C.
McKenna, Hugh F.	IV D	Chemist, United Indigo and Chemical Co., Ltd., Chelsea, Mass.
Midwood, Arnold J.	IV D	Chemist, Levinstein and Company, Boston, Mass.
Moore, Everett B.	I D	With Chadbourne and Moore, Chelsea, Mass.
Parker, Everett N.	I D	See Day, 1904.
Roberson, Pat H.	I C	With Jas. R. Roberson & Son, Cropwell, Ala.
Roberts, Carrie I.	IIIb C	Designer, Lowell, Mass.
xThomas, Roland V.	I C	Lowell, Mass.
Thompson, Everett L.	I D	With Brown, Durrell and Company, Boston, Mass.
Warren, Philip H.	II D	Supt., Hopeville Mfg. Co., Worcester, Mass.
Wheelock, Stanley H.	II D	Supt., Stanley Woolen Company, Uxbridge, Mass.
Wright, Edward, Jr.	II C	Asst. in Engineering Dept., State Board of Health, Boston, Mass.

Evening Course, 1905

xBake, Herbert	III C	Asst. Designer, Walworth Brothers, Lawrence, Mass.
Bastow, Henry	V C	See Evening, 1903.
xBell, Frederick W.	IIa C	With Mass. Mills, Lowell, Mass.
Bowie, Samuel A.	VI C	Lawrence, Mass.
xBrown, James P.	III C	Section Hand, Moore Spinning Co., No. Chelmsford, Mass.
xBryant, Ernest L.	VI C	Clerk, D. B. Wilson Company, Waterbury, Conn.

Name	Course	Occupation
xBurke, Thomas F.	I C	Lowell, Mass.
Burns, Edward J.	IV C	Tester, U. S. Cartridge Company, Lowell, Mass.
Burns, James E.	IV C	Foreman, Testing Dept., U. S. Cartridge Co., Lowell, Mass.
xCaron, Cleophas	I C	Overseer, Spinning Dept., Queen City Cotton Co., Burlington, Vt.
Collins, John A.	IIa-b C	Secretary, Mutual Boiler Ins. Company, Boston, Mass.
xCook, Cheney E.	III C	Buyer, Winslow Bros. and Smith Company, Norwood, Mass.
xCuster, James J. E.	V C	Lowell, Mass.
Dana, Clarence A.	VI C	Draftsman, Lowell Machine Shop, Lowell, Mass.
xDick, Hugo P.	III C	Loomfixer, Lower Pacific Mills, Lawrence, Mass.
Dimlick, Benj. C.	III C	Signal Dept., B. & M. Railroad, South Lawrence, Mass.
xErbe, Gustave	VI C	Foreman, J. L. Thompson Mfg. Company, Roberts, Mass.
xFoster, Sherwood L.	I C	With Lowell Brass Foundry, Lowell, Mass.
xFrench, Ernest J.	I C	Clerk, Upper Pacific Mills, Lawrence, Mass.
xGay, Earle B.	I C	Second Hand Carding, Dana Warp Mills, Westbrook, Me.
Goodchild, George	VI C	See Evening, 1903.
Harder, Elmer E.	VI C	Janitor, Highland School, Lowell, Mass.
xHaven, George W.	III C	With Blake and Stearns, Boston, Mass.
Howard, Thomas	V C	Overseer, T. Martin and Bro. Mfg. Co., Lowell, Mass.
xHunt, Herbert R.	VI C	Asst. Chief Draftsman, DeLamar's Copper Refining Co., Chrome, N. J.
xHunton, Lewis G.	IV C	In business, Lowell, Mass.
Kenworthy, Joseph	I C	Second Hand, Boott Mills, Lowell, Mass.
Kimball, Irving D.	VI C	Patent Dept., Lowell Machine Shop, Lowell, Mass.
Lamson, George F.	VI C	See Day, 1900.
Linkletter, Alfred C.	VI C	Steamfitter, H. R. Barker Mfg. Co., Lowell, Mass.
xLovell, Charles E.	VI C	Los Angeles, Cal.
Maguire, James H.	VI C	Overseer, Lowell Machine Shop, Lowell, Mass.
Martin, John C., Jr.	IIa-b C	Tailor, J. C. Martin, Lowell, Mass.
xMcManus, Hugh	V C	With Middlesex Co., Lowell, Mass.
Molloy, Andrew	III C	See Evening, 1902.
O'Neill, Peter F.	IV C	Warp Dyer, Arlington Mills, Lawrence, Mass.
xOverend, John	V C	Hand Dresser, Arlington Mills, Lawrence, Mass.
Redman, Henry S.	V C	See Evening, 1904.
Silk, Frederick C. M.	IV C	Colorist, Bigelow Carpet Co., Lowell, Mass.
Simola, Emil J.	IIa-b C	Finland.
xSkinner, Clarence W.	III C	With Brightwood Mfg. Co., No. Andover, Mass.

Name	Course	Occupation
xSmith, Arthur	III C	Designing, Pemberton Mills, Lawrence, Mass.
Smith, George A.	III C	Asst. Supt. and Designer, Tremont Worsted Co., Methuen, Mass.
Smith, Wm. E.	III C	Cloth Inspector, Arlington Mills, Lawrence, Mass.
Stevens, Frank W.	VI C	Draftsman, Locks and Canals, Lowell, Mass.
Stopherd, Wm. H.	III C	See Evening, 1899.
xTonge, John	IV C	Asst. Dyer and Chemist, Dana Warp Mills, Westbrook, Me.
xWilde, Thomas E.	IIa C	Stenographer, Jeremiah Clark Machine Co., Lowell, Mass.
Wiswall, Frank T.	V C	Student, Lowell Textile School, Lowell, Mass.

Day Course, 1906

Avery, Charles H.	II D	With Mauger & Avery, Boston, Mass.
Bradford, Roy H.	II D	Asst. Supt., Smith and Dove Mfg. Company, Andover, Mass.
Church, Charles R.	II-V C	Physical Director, Lowell Textile School, Lowell, Mass.
Churchill, Charles W.	III D	Treasurer, J. Harriman Narrow Fabric Co., Lowell, Mass.
Cole, Edward E.	IV D	With Sulloway Mills, Franklin Falls, N.H.
xCurrier, Herbert A.	I D	With C. E. Riley Co., New York City.
Curtis, Frank M.	I D	With Wm. Curtis Sons Co., Boston, Mass.
Fleming, Frank E.	IV D	Asst. Dyer and Finisher, Goodall Worsted Co., Sanford, Me.
Gahm, George L.	II D	Asst. Supt., Wood Worsted Mills, Lawrence, Mass.
Gillon, Sara A.	IIIb C	Designer, Lowell, Mass.
Hennigan, Arthur J.	II D	With The Noera Flannel and Woolen Mills, Boston, Mass.
Hildreth, Harold W.	II-V C	With Arlington Mills, Lawrence, Mass.
Hintze, Thomas F.	I C	New York City.
xKent, Clarence L.	III-V C	In business, Bay State Loan Co., Lawrence, Mass.
Lane, John W.	I C	With Everett Mills, Lawrence, Mass.
McDonnell, William H.	I-V C	South Boston, Mass.
Newcomb, Guy H.	IV C	Mgr. Badische Co., San Francisco, Cal.
Reynolds, Isabel H.	P. G. III-V C	See Day, 1903.
xStohn, Alexander C.	III-V C	Cloth Inspector, C. Stohn, Jamaica Plain, Mass.
Swan, Guy C.	II D	Student, Stanford University, Palo Alto, Cal.
Varnum, Arthur C.	II D	With Talbot Mills, No. Billerica, Mass.
Wightman, William H.	IV D	Salesman, Farbenfabriken of Elberfeld Co., Boston, Mass.
Wood, Herbert C.	I D	Instructor, Cotton Yarns, Lowell Textile School, Lowell, Mass.
Woodruff, Charles B.	V C	With Goodall, Brown and Co., Birmingham, Ala.

Evening Course, 1906

Name	Course	Occupation
Abbott, Paul W.	I C	Foreman, Cadillac Motor Car Co., Detroit, Mich.
Amiot, Louis H.	Va C	American Hide and Leather Co., Lowell, Mass.
Armstrong, Elias B.	IIb C	With Wellington, Sears & Co., Boston, Mass.
Bake, Herbert	P. G. III C	See Evening, 1905.
Brouder, John J.	III C	Designer, Ayer Mills, Methuen, Mass.
Brown, James P.	P. G. III C	See Evening, 1905.
xBrown, Wm. G.	IIb C	President, Geo. C. Moore Wool Scouring Mills and Brookside Worsted Mills, No. Chelmsford, Mass.
Burgess, Joseph H.	Va C	Pattern Weaver, Pemberton Mills, Lawrence, Mass.
Burnham, Joseph W.	III C	Designer, Lincoln Mills, Pascoag, R. I.
Burnham, Wilmont V.	Vb C	Weaver, Walworth Bros., Lawrence, Mass.
Dick, Hugo P.	P. G. III C	See Evening, 1905.
xDickson, Andrew	IIa C	Asst. Shipping Clerk, Coronet Worsted Co., Mapleville, R. I.
Dimlick, Benj. C.	P. G. III C	See Evening, 1905.
Dodge, Frank	I C	Overseer, Hamilton Co., Lowell, Mass.
xDuce, Benj.	III C	Overseer Weaving, Brightwood Mfg. Co., No. Andover, Mass.
xEllis, George W.	VII C	With A. D. Ellis & Sons, Monson, Mass.
Eyers, John T.	IV C	Woolen Finisher, Franklin Woolen Co., Franklin, N. H.
Frank, Emil M.	P. G. III C	See Evening, 1904.
xFulton, John M.	V C	Lowell Bleachery, Lowell, Mass.
Gregson, Robert B.	Va C	Second Hand, Combing Room, Grant Yarn Co., Fitchburg, Mass.
xHaigh, Wm.	Vb C	Boott Mills, Lowell, Mass.
xHartwell, Henry E.	VI C	Engineer, Washington Mills, Lawrence, Mass.
Hoessler, Carl, Jr.	III C	Second Hand, Weaving, Stevens & Son, Franklin, N. H.
Howard, John	IIa C	See Evening, 1900.
xHutton, Harold	V C	With N. E. Bunting Co., Lowell, Mass.
xHutton, John M.	Vb C	With N. E. Bunting Co., Lowell, Mass.
xInberg, Magnus	I C	Fitchburg, Mass.
Johnson, Ernest A.	V C	See Evening, 1902
Kidd, Thomas E.	IV C	Boston, Mass.
Laffert, August W.	III C	Loomfixer, Wood Worsted Mills, Lawrence, Mass.
Maguire, James H.	I C	See Evening, 1905.
xMcCarthy, Joseph F.	III C	Cloth Examiner, Wood Worsted Mills, Lawrence, Mass.
xMcLaughlin, Peter J.	I C	Second Hand, Mass. Cotton Mills, Lowell, Mass.
McLay, John	Vb C	Clerk, Washington Mills, Lawrence, Mass.
Michelmores, Harry	III C	Asst. Designer, Brightwood Mfg. Co., No. Andover, Mass.
Molloy, Andrew	P. G. III C	See Evening, 1902.
Morton, Albert N.	IIb C	At Lowell Machine Shop, Lowell, Mass.

Name	Course	Occupation
xMurphy, Cornelius D.	IIa C	Second Hand, N. E. Bunting Co., Lowell, Mass.
Nelson, Ernest H.	III C	See Evening, 1900.
O'Brien, David A.	I C	With Thos. Hollis & Co., Boston, Mass.
xPedler, Wm. A.	I C	Clerk, Cotton Dept., Arlington Mills, Lawrence, Mass.
Pihl, Christian E.	VI C	Master Mechanic, Appleton Mills, Lowell, Mass.
xPittendreigh, John M.	I C	Third Hand, Merrimack Mill, Lowell, Mass.
Reardon, Timothy H.	VI C	Machinist, Lowell Machine Shop, Lowell, Mass.
Reynolds, Eugene A.	VI C	With Lawrence Mfg. Co., Lowell, Mass.
xRichards, Francis G.	IIa C	Wool Sorter, Arlington Mills, Lawrence, Mass.
Rushworth, Walter	VI C	Electrician, Pope-Barnes Electric Co., Boston, Mass.
Schubert, George J.	V C	Second Hand, Pemberton Co., Lawrence, Mass.
Senior, George	Va C	Seattle, Wash.
Sharpe, John R.	VI C	Overseer, Lowell Machine Shop, Lowell, Mass.
xSheppard, Byron H.	VI C	Draftsman, C. R. Makepeace and Company, Providence, R. I.
Silk, Patrick E.	VII C	Second Hand, Finishing, Beaver Brook Mills, Collinsville, Mass.
Skinner, Clarence W.	P. G. III C	See Evening, 1905.
Smith, Arthur	P. G. III C Va C	See Evening, 1905.
Smith, George A.	P. G. III C	See Evening, 1905.
Smith, Wm. E.	P. G. III C	See Evening, 1905.
Stopherd, Wm. H.	P. G. III C	See Evening, 1899.
Vogt, Harry A.	Vb C	Loomfixer, Wood Worsted Mills, Lawrence, Mass.
Walker, Wm., Jr.	VII C	Asst. to Supt., Ottaqueeche Woolen Co., No. Hartland, Vt.
xWard, James J.	VII C	With U. S. Bunting Co., Lowell, Mass.
*Whitcomb, Harry E.	I C	

Day Course, 1907

Arundale, Henry B.	II D	See Day, 1905.
xBrannen, Leon V.	III-V C	Philadelphia, Pa.
Coman, James G.	I D	Overseer, Tupelo Cotton Mills, Tupelo, Miss.
xCraig, Albert W.	IV D	Color Chemist, Arthur Merritt, Boston, Mass.
Ehrenfried, Jacob B.	II-V C	With Geo. Ehrenfried Co., Lewiston, Me.
Farmer, Chester J.	IV D	Instructor, Fellow Dept., Biological Chemistry, Harvard Medical School, Boston, Mass.
xHaskell, Spencer H.	II D	Worcester, Mass.
Hathorn, George W.	IV D	Instructor, Dyeing Dept., Lowell Textile School, Lowell, Mass.

Name	Course	Occupation
Hildreth, Harold W.	II D	See Day, 1906.
Hoyt, Charles W. H.	IV D	Second Hand, Dyeing, Merrimack Mfg. Co., Lowell, Mass.
Knowland, Daniel P.	IV D	With Dexter, Richards & Sons Co., Newport, N. H.
Lane, John W.	I-V C	See Day, 1906.
Mackay, Stewart	III D	Instructor, Hand Loom Weaving, Lowell Textile School, Lowell, Mass.
Meek, Lotta	IIIb C	Lowell, Mass.
Merriman, Earl C.	II D	With Jas. & E. H. Wilson, Pittsfield, Mass.
Raymond, Charles A.	IV D	Chemist, N. E. Gas and Coke Company, Everett, Mass.
xStorer, Francis E.	II D	Clerk, National Shawmut Bank, Boston, Mass.
Stursberg, Paul W.	II D	Germany.
Woodcock, Eugene C.	II D	Instructor, Woolen Yarns, Lowell Textile School, Lowell, Mass.

Evening Course, 1907

xAckroyd, Theodore C.	IIb C	Chicago, Ill.
xBain, William A.	VII C	Overseer, Dyeing, Priscilla Woolen Co., Spencer, Mass.
Bake, Herbert	VII C	See Evening, 1905.
Ballinger, Frederick W.	IIb C	With Moore Spinning Co., No. Chelmsford, Mass.
Barber, James E.	IIb C	Combing Fixer, Moore Spinning Company, No. Chelmsford, Mass.
Barraclough, John C.	I C	Clerk, Arlington Mills, Lawrence, Mass.
Bastow, Stephen W.	IV C	Second Hand, Dyehouse, Nashua Mfg. Co., Nashua, N. H.
xBayard, Pierre P.	III C	South Bend, Ind.
Begen, Thomas W.	IIb C	Overseer, Washington Mills, Lawrence, Mass.
xBenoit, William A.	Va C	Loom Fixer, Everett Mills, Lawrence, Mass.
xBouille, Arthur L.	Vb C	Washington Mills, Lawrence, Mass.
Brannen, Leon V.	IIa C	See Day, 1907.
Brouder, John J.	VII C	See Evening, 1906.
Bucklitsch, Gustave J.	IIb C	Section Hand, Washington Mills, Lawrence, Mass.
Burgess, Joseph H.	Vb C	See Evening, 1906.
Butterworth, Charles A.	Va C	Corduroy Cutter, Merrimack Mfg. Co., Lowell, Mass.
Butterworth, John A.	IIb C	Section Hand, Washington Mills, Lawrence, Mass.
xCarden, Francis E.	IIb C	Mass. Cotton Mills, Lowell, Mass.
Carlson, Ernest B.	IIb C	Fixer, Moore Spinning Co., West Chelmsford, Mass.
Dick, Hugo P.	IIb C	See Evening, 1905.
Dobbs, Willie	IIb C	Second Hand, Mass. Mohair Plush Co., Lowell, Mass.
xDodge, Charles P.	IIa C	Machinist, C. S. Dodge, Lowell, Mass.

Name	Course	Occupation
Duce, Benjamin	VII C	See Evening, 1906.
xFlint, Leon G.	III C	Percher, Washington Mills, Lawrence, Mass.
Frechette, Alphonse J.	IIb	Student, St. Mary's College, Van Buren, Me.
xGillespie, James E.	VII C	Wet Finishing, Brightwood Mfg. Company, No. Andover, Mass.
Gregson, Robert B.	I-Vc C	See Evening, 1906.
Haartz, John C.	VII C	Textile Selling Agent, W. A. and J. C. Haartz, Boston, Mass.
xHaas, Ignatius	I C	New York City.
Hamblett, Harry A.	I C	Second Hand, Merrimack Mfg. Co., Lowell, Mass.
xHanglin, Albert J.	IV C	With American Hide and Leather Co., Lowell, Mass.
xHanglin, William E.	Vb C	Worcester, Mass.
Hebert, Charles L. J.	IV C	With Federal Shoe Co., Lowell, Mass.
xHitchen, Harry S.	Vb C	Bay State Mills, Lowell, Mass.
xHitchen, Thomas G.	Vb C	Bay State Mills, Lowell, Mass.
Howard, John	VII C	See Evening, 1900.
xIgnatius, Pentti	Va C	Appleton Co., Lowell, Mass.
Jepson, Harry	Vb C	With U. S. Bunting Co., Lowell, Mass.
Kelley, Michael H.	III C	See Evening, 1902.
xKirsch, Alfred O.	Vb C	Washington Mills, Lawrence, Mass.
Laffert, August W.	VII C	See Evening, 1906.
Lake, William F.	III C	Asst. Designer, Middlesex Co., Lowell, Mass.
xMarjerison, T. Sydney	III C	Clerk, Lower Pacific Mills, Lawrence, Mass.
Martin, Willard E.	III C	With Warburton Dry Goods Co., Providence, R. I.
Michelmores, Harry	VII C	See Evening, 1906.
Myers, James W.	VII C	See Evening, 1903.
xNelson, Charles E.	IIb C	West Chelmsford, Mass.
xO'Brien, Michael F.	IIb C	Bigelow Carpet Co., Lowell, Mass.
Porter, George K., Jr.	III C	With Wellington, Sears & Co., Boston, Mass.
Read, Paul A.	VII C	Supt., Barnaby Mfg. Co., Fall River, Mass.
Redman, Henry S.	I C	See Evening, 1904.
Ritter, Alfred E.	IIb C	With Geo. H. Hadley & Co., Lawrence, Mass.
Robbins, John	IIb C	Overseer, Moore Spinning Co., No. Chelmsford, Mass.
Senior, George	I-Vc C	See Evening, 1906.
Skinner, Clarence W.	VII C	See Evening, 1905.
Smith, Arthur	Vc C	See Evening, 1905.
Smith, Ernest B.	Vb C	Warp Dresser, American Woolen Co., Lawrence, Mass.
xSmith, James	Vb C	Loom Fixer, Wood Worsted Mills, Lawrence, Mass.
xSmith, Percy H.	Vb C	Washington Mills, Lawrence, Mass.
Smith, William E.	VII C	See Evening, 1905.
Varnum, Arthur C.	Vb C	See Day, 1906.
xWahlberg, Einar S.	I C	Fitchburg, Mass.

Name	Course	Occupation
Waterworth, Frank W.	Vb C	Second Hand, Washington Mills, Lawrence, Mass.
Webb, Francis H.	III C	See Evening, 1904.
xWebber, John F.	III C	Designer, Joy, Langdon and Co., Boston, Mass.
Whittaker, Thomas	IIb C	Clerk, Arlington Mills, Lawrence, Mass.
Wiggin, Leon M.	III C	Asst. Designer, U. S. Bunting Co., Lowell, Mass.
xWolf, William C.	Va C	Loom Fixer, Pacific Mills, Lawrence, Mass.
xWolger, John J.	III C	Loom Fixer, Methuen Co., Methuen, Mass.
xYare, John F.	Vb C	Middlesex Co., Lowell, Mass.

Day Course, 1908

Abbott, George R.	II D	Asst. to Supt., Columbian Rope Co., Auburn, N. Y.
Ballard, Horace W. C. S.	IV D	Overseer of Dyeing, Dexter, Richards and Sons Co., Newport, N. H.
Dwight, John F., Jr.	II D	Asst. Designer, Standish Worsted Co., Plymouth, Mass.
Farr, Leonard S.	II D	With Farr Alpaca Co., Holyoke, Mass.
Gay, Olin D.	II D	Asst. Supt., Gay Bros. Co., Cavendish, Vt.
Hadley, Walter E.	IV D	Asst. Instructor in Chemistry, Lowell Textile School, Lowell, Mass.
Huising, Geronimo H.	I D	With Merrimack Mfg. Co., Lowell, Mass.
Jenckes, Leland A.	VI D	Asst. Master Mechanic, Dwight Mfg. Co., Chicopee, Mass.
Lewis, LeRoy C.	IV D	Color Chemist, Farbenfabriken of Elberfeld Co., New York City.
Mailey, Howard T.	II D	With Wood Worsted Mills, Lawrence, Mass.
Perkins, Joshua D.	III D	With Amoskeag Mfg. Co., Manchester, N. H.
Prince, Sylvanus C.	VI D	With Windsor Machine Co., Windsor, Vt.
Proctor, Braman	IV D	Salesman, Badische Co., Boston, Mass.
Reynolds, Fred B.	II D	Clerk, M. T. Stevens and Sons Co., No. Andover, Mass.
Robinson, Ernest W.	IV D	Chemist and Overseer of Dyeing, Rock Mfg. Co., Rockville, Conn.
Weinz, W. Elliot	IV D	Chemist, Badische Co., New York City.
Wingate, William H.	IV D	Chemist, Sidney Blumenthal and Co., Shelton, Conn.

Evening Course, 1908

Arnold, Warren H.	VII C	Loomfixer, U. S. Bunting Co., Lowell, Mass.
xBarrington, James L.	IV C	Color Chemist, Kalle and Co., New York City.
Begen, Thomas W.	IIb C	See Evening, 1907.
xBerry, Alfred H.	VI C	Electrical Engineer, Moore Spinning Co., No. Chelmsford, Mass.

Name	Course	Occupation
Broadbent, James H.	Vb C	With U. S. Bunting Co., Lowell, Mass.
xBroadbent, William	Vb C	Weaver, U. S. Bunting Co., Lowell, Mass.
xBrown, James T.	III C	Section Hand, Moore Spinning Co., No. Chelmsford, Mass.
Buckley, Harry	IV C	Overseer, Warp Dyeing, Arlington Mills, Lawrence, Mass.
Campbell, Archibald	IV C	Asst. to Chemist, J. C. Ayer Co., Lowell, Mass.
Carden, Francis E.	IIb C	See Evening, 1907.
xCarney, William J.	I C	With Arlington Mills, Lawrence, Mass.
xCarter, Charles R.	Vb C	Weaver, Washington Mills, Lawrence, Mass.
xCorr, Eben W.	Vb C	With Prudential Life Ins. Co., Lawrence, Mass.
xCorr, James F.	Vb C	Pattern Weaver, Bay State Mills, Lowell, Mass.
Craven, Harry	VII C	Clerk, Arlington Mills, Lawrence, Mass.
Dick, Hugo P.	Vb C	See Evening, 1905.
Dixon, Arthur	III C	With Elston Worsted Co., Methuen, Mass.
Dobbs, Willie	IIb C	See Evening, 1907.
xDunn, George C.	III C	Third Hand, Dyehouse, Tremont and Suffolk Mills, Lowell, Mass.
Flynn, William J.	Vb C	Weaver, Faulkner Mills, No. Billerica, Mass.
Greenhalge, James	Vc C	Second Hand, Hamilton Mfg. Co., Lowell, Mass.
xHallbauer, William R.	Vb C	At Washington Mills, Lawrence, Mass.
Hanson, Edward	III C	Overseer, Merrimack Mfg. Co., Lowell, Mass.
xHardman, David B.	IV C	Machine Printer, Pacific Mills, Lawrence, Mass.
xHarris, Louis	VII C	Asst. to Clothing Designer, J. Peavy and Bros., Boston, Mass.
xHennessey, Ambrose M.	VII C	At Talbot Mills, No. Billerica, Mass.
Hill, Harold	I C	Section Hand, Arlington Mills, Lawrence, Mass.
xHoellrich, Martin J.	Vb C	With Wood Worsted Mills, Lawrence, Mass.
xIngham, Benjamin W.	I C	Section Hand, Boott Mills, Lowell, Mass.
xLagerbald, Jarl	VII C	Asst. Chemist, Wood Worsted Mills, Lawrence, Mass.
Lake, William F.	P. G. III C	See Evening, 1907.
Maker, Isaac A.	I C	Draftsman, Lowell Machine Shop, Lowell, Mass.
Marjerison, T. Sydney	P. G. III C	See Evening, 1907.
Marshall, Fred K. R.	VI C	Electrician, Arlington Mills, Lawrence, Mass.
McGill, William E.	VII C	Second Hand, Worcester Woolen Co., Worcester, Mass.
xMcGovern, James	VII C	Cloth Inspector, Arlington Mills, Lawrence, Mass.
McKenna, Jeremiah J.	Vb C	With Merrimack Woolen Co., Dracut, Mass.
Mortenson, Carl W.	IIa C	See Evening, 1903.
Nutter, James R.	VI C	With Merrimack Mfg. Co., Lowell, Mass.

Name	Course	Occupation
*Osbeck, William J.	III C	
xPatterson, Alfred H.	III C	Clerk, Lower Pacific Mills, Lawrence, Mass.
xPerkins, Thomas, Jr.	I C	Asst. Supt., Tremont and Suffolk Mills, Lowell, Mass.
Picken, William	III C	Purchasing Agent, Moore Spinning Co., No. Chelmsford, Mass.
Plumer, Paul T.	Vb C	Pattern Weaver, U. S. Bunting Co., Lowell, Mass.
Porter, George K., Jr.	P. G. III C	See Evening, 1907.
Preble, George A.	III C	Second Hand, Mass. Cotton Mills, Lowell, Mass.
xSaalfrank, Joseph C.	III C	Design Dept., Arlington Mills, Lawrence, Mass.
Scally, Edward	VI C	With Wm. Scally, Lowell, Mass.
Schermerhorn, George E.	Va C	See Evening, 1902.
xSchuster, William F.	VII C	Second Hand, Washington Mills, Lawrence, Mass.
Seddon, N. Graham	III C	Second Hand, Everett Mills, Lawrence, Mass.
Semple, Alexander	III C	Shipping Clerk, Hamilton Mfg. Company, Lowell, Mass.
Shackleton, J. Henry	IV C	Overseer, Dyeing, Pemberton Mills, Lawrence, Mass.
Simoneau, Verner W.	VI C	Machinist, Upton and Gilman, Lowell, Mass.
Spurr, Albert R.	VII C	Wet Finisher Second Hand, Pacific Mills, Lawrence, Mass.
Spurr, James H., Jr.	IV C	Asst. Bacteriologist and Chemist, State Board of Health Experiment Station, Lawrence, Mass.
xStewart, Charles	Va C	Weaver, Tremont and Suffolk Mills, Lowell, Mass.
xTeichmann, Alfred A.	Vb C	With Pemberton Mills, Lawrence, Mass.
Tucker, John T.	I C	Clerk, Kitson Machine Shop, Lowell, Mass.
Varnum, Arthur C.	P. G. III C	See Day, 1906.
Webber, John F.	P. G. III C	See Evening, 1907.
Whittaker, Thomas	IIb C	See Evening, 1907.
Wiggin, Leon M.	P. G. III C	See Evening, 1907.
Willgeroth, Henry J.	III C	Asst. Designer, Wood Worsted Mills, Lawrence, Mass.
Wilmot, Joseph	III C	Instructor, Weaving Dept., Lowell Textile School, Lowell, Mass.
Wolf, William C.	Vb C	See Evening, 1907.
Wood, Jonathan	Va C	See Evening, 1902.
xYoung, Richard, Jr.	Va C	Loomfixer, Mass. Cotton Mills, Lowell, Mass.

Day Course, 1909

Brainerd, Arthur T.	IV D	With H. A. Metz., New York City.
Conant, Harold W.	I D	With Conant, Houghton & Co., Littleton, Mass.
Fairbanks, Almonte H.	II D	Traveling Salesman, Frank E. Paige and Co., Boston, Mass.

Name	Course	Occupation
Ferguson, William G.	III D	Cost Finding, Anchor Webbing Co., Woonsocket, R. I.
Fiske, Starr H.	II D	Instructor, Weaving Dept., Lowell Textile School, Lowell, Mass.
Gyzander, Arne K.	IV D	In Dyehouse, Faulkner Mills, No. Billerica, Mass.
Holden, Francis C.	IV D	With Bigelow Carpet Co., Clinton, Mass.
Kay, Harry P.	II D	With Arlington Mills, Lawrence, Mass.
Laughlin, James K.	III D	East Greenwich, R. I.
Levi, Alfred S.	IV D	Asst. Mgr. and Chemist, Liondale Bleach, Dye and Print Works, Rockaway, N. J.
Mason, Archibald L.	VI D	Billerica Centre, Mass.
Mullen, Arthur T.	II D	With Bigelow Carpet Co., Clinton, Mass.
Newall, J. Douglas	IV D	With Minetto Shade Cloth Co., Minetto, N. Y.
Parkis, William L.	I D	Asst. Foreman, Weaving, Boston Woven Hose and Rubber Co., Cambridgeport, Mass.
Pease, Chester C.	I D	Third Hand, Whitman Mills, New Bedford, Mass.
Potter, Carl H.	I D	With Saylesville Bleachery, Saylesville, R. I.
Prescott, Walker F.	IV D	Section Hand, Roxbury Carpet Co., Roxbury, Mass.
Saunders, Harold F.	IV D	Chemist, Pacific Mills, Lawrence, Mass.
Stone, Ira A.	IV D	With Wool and Cotton Reporter, Boston, Mass.
Wood, J. Carleton	IV D	With Mt. Hope Finishing Co., No. Dighton, Mass.

Evening Course, 1909

Anderson, Carl A.	IV C	Machinist, General Electric Co., Lynn, Mass.
Arnold, Warren H.	III C	See Evening, 1908.
xBailey, Rothwell	Va C	With Mass. Cotton Mills, Lowell, Mass.
Bake, Herbert	P. G. III C	See Evening, 1905.
Banks, Jonas	Va C	Loomfixer, Mass. Cotton Mills, Lowell, Mass.
Benoit, Benjamin L.	VIb C	Clerk, Lowell Weaving Co., Lowell, Mass.
Booth, Arthur	III C	Clerk, Arlington Mills, Lawrence, Mass.
Bowen, Herbert E.	III C	Knitting Machine Fixer, Lowell Hosiery Co., Lowell, Mass.
Buckley, Richard A.	Vb C	Percher, Musketaquid Mill, Lowell, Mass.
Bunce, Raymond H.	Vb C	With Bay State Mills, Lowell, Mass.
Butler, Elizabeth M.	VIId C	Teacher, City of Lowell, Lowell, Mass.
Carman, William	Va C	With Mass. Cotton Mills, Lowell, Mass.
Chesworth, Frank K.	Va C	With Everett Mills, Lawrence, Mass.
Cockell, Frederick H.	III C	Loomfixer, Washington Mills, Lawrence, Mass.
Cowdrey, Charles E.	Vb C	See Evening 1902.
xDavison, Frank L.	Vb C	With Talbot Mills, No. Billerica, Mass.
Dulligan, Charles E.	VIa C	Tool Maker, U. S. Cartridge Co., Lowell, Mass.

Name	Course	Occupation
Dunning, Carlos W.	VIb C	With Appleton Co., Lowell, Mass.
Gaunt, Ernest H.	III C	Supt., Wool Mill, Tremont Worsted Mills, Methuen, Mass.
Gilinson, Philip J.	VIa C	Machinist, Heinze Electric Co., Lowell, Mass.
Gordon, Herbert E.	III C	Clerk, Arlington Mills, Lawrence, Mass.
Hanson, Edward	P. G. III C	See Evening, 1908.
xHayes, Michael C.	IIa C	With Talbot Mills, No. Billerica, Mass.
Hill, Harold	Va C	See Evening, 1908.
Hillier, Arthur P.	IIb C	Section Hand, Moore Spinning Co., No. Chelmsford, Mass.
Hodgkins, Albert A.	VII C	Student, Lowell Textile School, Lowell, Mass.
Holt, Harry C.	VIa C	Electrician, Mass. Cotton Mills, Lowell, Mass.
Houston, William I.	III C	Weaver, Washington Mills, Lawrence, Mass.
Howell, Edward A.	Va C	Loomfixer, Pemberton Mills, Lawrence, Mass.
xJoyce, John	Vc C	Weaver, Merrimack Mfg. Company, Lowell, Mass.
Kaler, Harold F.	VIb C	Tester, Heinze Electric Co., Lowell, Mass.
Kelley, Bernard J., Jr.	VIc C	With P. J. O'Hearn, Lowell, Mass.
Kershaw, Benn	Va C	Loomfixer, Hamilton Mfg. Co., Lowell, Mass.
Lincourt, Henry E.	VIb C	With Federal Shoe Co., Lowell, Mass.
Madden, Peter	Va C	Loomfixer, Mass. Cotton Mills, Lowell, Mass.
Mahoney, Dennis J.	Vb C	With Talbot Mills, No. Billerica, Mass.
McClure, Charles G.	VIb C	Lowell, Mass.
McLay, John	IIb C	See Evening 1906.
Molloy, Andrew	P. G. III C	See Evening, 1902.
Musard, Albert E., Jr.	Vc C	With Merrimack Mfg. Co., Lowell, Mass.
Nelson, Ernest H.	I C	See Evening, 1900.
Orrell, Frank L.	VIb C	Section Hand, Mass. Mohair Plush Co., Lowell, Mass.
Palmer, G. Buel	Vb C	See Evening, 1903.
Paquin, Joseph	VIa C	Detroit, Mich.
Parsons, Joseph G.	III C	Design Dept., Beebe and Webber Co., Holyoke, Mass.
Pearson, Fred	VIa C	Machinist, Lowell Machine Shop, Lowell, Mass.
Read, Paul A.	Va C	See Evening, 1907.
Robinson, Thomas	I C	Mule Spinner, Boott Cotton Mills, Lowell, Mass.
Ryan, Edward P.	I C	Overseer, Tremont and Suffolk Mills, Lowell, Mass.
Schubert, George J.	III C	See Evening, 1906.
Schuerfeld, Harry W.	III C	Salesman, C. U. Thomas and Co., Boston, Mass.
Smith, Arthur	P. G. III C	See Evening, 1905.
Smith, George A.	VII C	See Evening, 1905.
Smith, William E.	P. G. III C	See Evening, 1905.
Stocks, Carl W.	VI C	With Everett Mills, Lawrence, Mass.

Name	Course	Occupation
Stopherd, William H.	P. G. III C	See Evening, 1899.
Sullivan, Humphrey F.	I C	Asst. Overseer, Lowell Machine Shop, Lowell, Mass.
Sykes, Alvin E.	VIa C	Machinist, Lowell Machine Shop, Lowell, Mass.
Tucker, John T.	Va C	See Evening, 1908.
Varnum, Arthur C.	VII C	See Day, 1906.
Vogt, Alfred H.	IIb C	See Evening, 1902.
Walsh, Michael L.	I C	Section Hand, Appleton Co., Lowell, Mass.
Ware, Edward W.	III C	Clerk, Wellington, Sears and Co., Boston, Mass.
Watson, Luther F.	IIb C	Clerk, Arlington Mills, Lawrence, Mass.
Weigel, Frederick A.	VIb C	Machinist, Stanley Mfg. Co., Lawrence, Mass.
Young, Richard, Jr.	Vc C	See Evening, 1908.

CONTENTS

Administration	9-132
Advanced Standing	77
Alumni Association	135
Application Blank	79-193-194
Athletics	69
Attendance	85
Attendance Card	79
Awards of Merit	83
Buildings	21
Bulletins and Catalogue	88
Calendar	12-13
Certificate of Evening Courses	25
Conduct	85
Corporation	5
COURSES OF INSTRUCTION :	
Day Classes	25-89
Evening Classes	25
Diploma	85
Entrance Qualifications	71
Equipment	31
Examinations	81
Fees	79
General Committees	7
General Information	87
Graduate Course	83
Graduates, Day Class, 1909	136
Graduates, Evening Classes, 1909	137
Graduates, Alphabetical Register	155
Graduates, Class Register	169
Introduction	15
Instructors	9-132
Library	87
Materials	88
Medal	85
Object of the School	15
OUTLINE OF INSTRUCTION :	
Chemistry and Dyeing Department	112
Cotton Department and Knitting	100
Decorative Art Department	111
Designing and Power Weaving Department	109
Finishing Department	121
Textile Engineering Department	125
Woolen and Worsted Department	105
Records and Reports of Standing	81
Register of Day Students	139
Register of Evening Students	143
Sessions	87
Southwick Textile Club	135
Thesis	81
Women's Department	31

Lowell Textile School

LOWELL, MASS.

APPLICATION BLANK

Date.....

I,hereby
 apply for admission to the Lowell Textile School as DAY
 student.

Name in Full,

Date and Place of Birth,

Home Residence,

Parent or Guardian,

Residence of Parent or Guardian,

School last attended,

(INDICATE COURSE)

- | | |
|--------------------------|---------------------------|
| I. Cotton Manufacturing. | II. Wool Manufacturing. |
| III. Textile Designing. | IV. Chemistry and Dyeing. |
| VI. Textile Engineering. | |

Signature,

ENDORSEMENT BY OFFICER OF SCHOOL LAST ATTENDED

I hereby certify that
 the above applicant has completed the regular four years
 course at the..... High School, and has satisfac-
 torily passed the subjects required under "Entrance Qualifica-
 tions," pages 71-77 of Catalogue of 1910-1911. He has passed
 satisfactorily.....years course in French or German.

Signed :

Principal School, located
 at State of

Date.....

FORM FOR EVENING CLASSES ON OTHER SIDE

FILL OUT AND SEND TO PRINCIPAL

Lowell Textile School

LOWELL, MASS.

APPLICATION BLANK

DATE.....

I, hereby
 apply for admission to the Lowell Textile School as *EVENING*
 student.

Name in Full,

Date and Place of Birth,

Home Residence,

Parent or Guardian,

Residence of Parent or Guardian,

School last attended,

(INDICATE COURSE)

I. Cotton Spinning.

V. Weaving.

 II. a—Woolen Spinning.
 b—Worsted Spinning.

 a—Cotton Weaving.
 b—Woolen and Worsted Weaving.
 c—Dobby and Jacquard Weaving.

III. Designing.

VI. Engineering.

IV. Chemistry and Dyeing.

 a—Mechanics and Electricity.
 b—Mechanical Drawing.
 c—Architectural Drawing.
 d—Freehand Drawing.
 e—Machine Shop.

 a—Elementary Chemistry.
 b—Textile Chemistry and Dyeing.
 c—Analytical Chemistry
 d—Textile and Analytical Chem-
 istry.

VII. Woolen and Worsted Finishing.

Signature,

ENDORSEMENT BY SOME OFFICER OF SCHOOL LAST ATTENDED

I hereby certify that
 the above applicant is duly qualified to pursue with profit the
 work of the Lowell Textile School.

SIGNED:

Principal School, located

at State of

Date

BULLETIN

OF THE

Lowell Textile School

Lowell, Massachusetts, U. S. A.



ISSUED QUARTERLY

Entered Aug. 26, 1902, at Lowell, Massachusetts
as second-class matter under Act of
Congress, July 16, 1894

Moody Street and Colonial Avenue

OR BULLETIN AND TERMS ADDRESS CHARLES H. EAMES, PRINCIPAL

Plans and Extensions

In the establishment of the Lowell Textile School the articles of incorporation set forth in no unmistakable terms the purpose of the institution, viz.: "to give instruction in the theory and practical arts of textile and kindred industries." The Trustees, constantly keeping this object in view, have added steadily to the curriculum, instructing staff, buildings and equipment for the express purpose of covering instruction in every branch of the "textile and kindred industries."

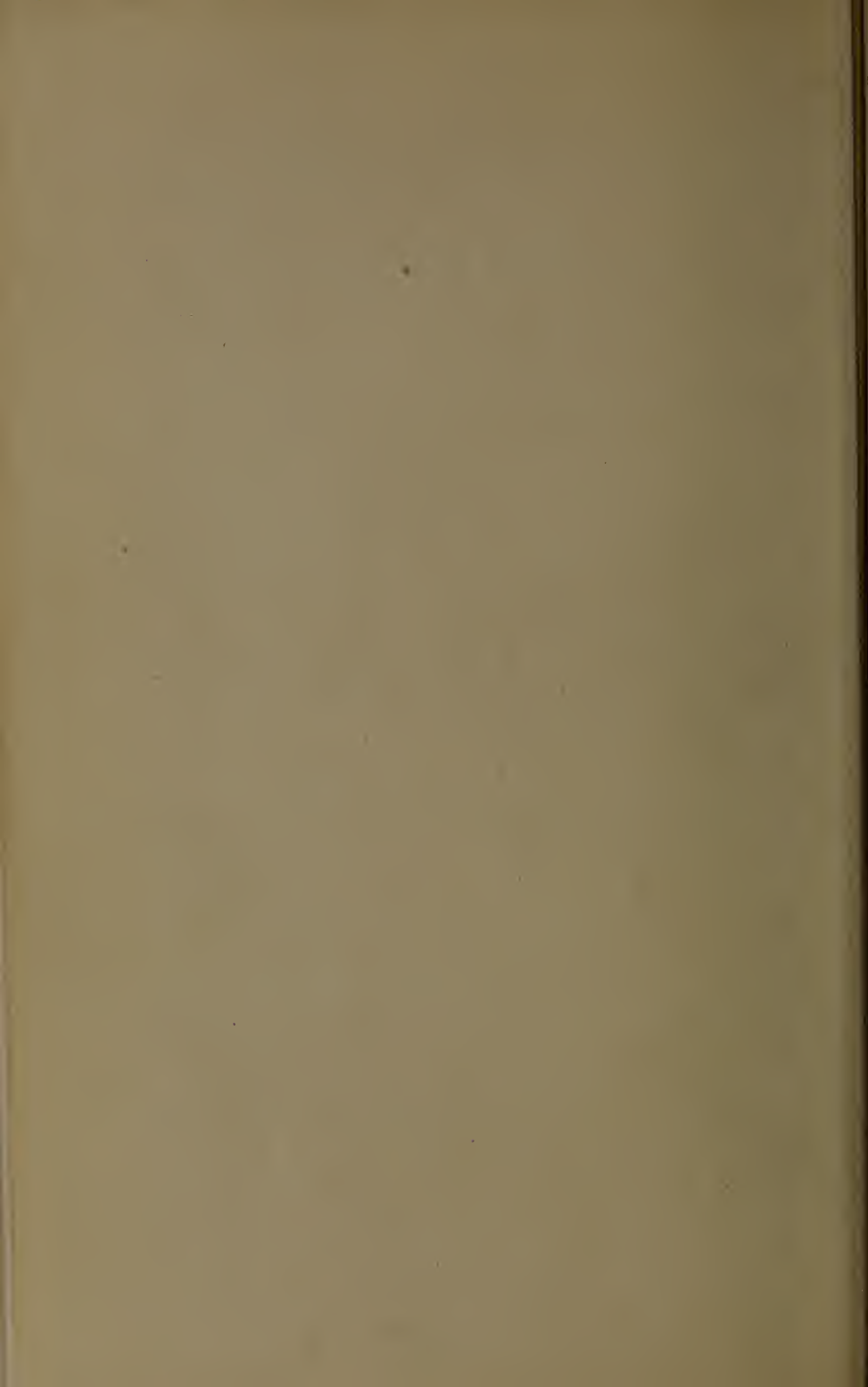
It was of course impossible to open the school at the beginning complete in all departments, for at its establishment neither the needs of the industries nor the breadth of the field of work open to such a school were fully appreciated. There has been a steady growth with an ever widening field as each demand made by the industry upon the school became apparent. When one realizes the increasing number of problems which confront the man advancing from second hand to treasurer and manager, and learns more of the great variety of departments of the mill in which these problems occur, he can easily understand the necessity of establishing each of the departments maintained at the Lowell Textile School. These departments have each felt the influence from the industry and are constantly broadening, taking up new branches, which require new machines, additional instructors as specialists in the several lines, and more floor space.

The endeavor of the school to make the student acquainted with every branch of his chosen line has resulted in making the work in some of the three year courses overtaxing. The needs however do not cease. The value of additional work in certain technical lines and the desirability of courses in subjects having

a general bearing upon the full training of a mill manager, have been appreciated by both graduate and undergraduate. To meet this, a post graduate year is contemplated and a detail description of the courses will be given in a later issue of this bulletin.

During the present summer an addition to the buildings has been made in the form of a single story building fronting Colonial Avenue and extending from Southwick Hall to the Falmouth Street Building. This will provide extension for the Woolen and Worsted and Chemistry and Dyeing Departments. The entire work upon architectural plans, and supervision of erection of this building has been done by the Engineering Department. A special feature of the work has been the manufacture of white surfaced cement bricks. These have been used to face the walls of the building and are but one instance of the economy practised to increase the efficiency of the plant. The excavation for a new boiler house and coal pocket has also been completed, but the building will not be erected until next summer.

Fenwick Umpleby who for thirteen years has been Head Instructor of the Design Department, resigned to become the Principal of the Bradford-Durfee Textile School of Fall River, Mass. The resignation of Harold Nickerson, S. B., instructor in Decorative Art, became effective at the end of the last school year. The management of the school in searching for a competent successor to the head of the Design Department believes that it is particularly fortunate in securing the services of Hermann H. Bachmann who comes to us after a long experience in designing textile fabrics in both this country and Germany. Among the concerns with whom he has been associated as designer may be mentioned: the Parkhill Manufacturing Co., of Fitchburg; the Lorraine Manufacturing Co., of Pawtucket, R. I., and the Smith Webbing Company of the same city. His skill and ability in both the textile and decorative art branches will make it possible for him to take charge of both of these departments as well as the weaving, thus making a most harmonious whole of the fabric making departments.



BULLETIN

OF THE

Lowell Textile School

Lowell, Massachusetts, U. S. A.



ISSUED QUARTERLY

Entered Aug. 26, 1902, at Lowell, Massachusetts
as second-class matter under Act of
Congress, July 16, 1894

Moody Street and Colonial Avenue

FOR BULLETIN AND TERMS ADDRESS CHARLES H. EAMES, PRINCIPAL

Preparation

The entrance requirements for admission to the day classes of the Lowell Textile School are set forth in detail on pages 71-77 of the Catalogue of 1910-1911, and will be carefully described in the school catalogue to be issued in February of next year. Nevertheless, it may not be out of place at this time to call to the attention of applicants for entrance in September 1911, and thereafter the importance of thorough acquaintance with the subjects deemed most essential in the preparation for the work at this school.

These may be mentioned under the headings of Mathematics, comprising Algebra to quadratics, Plane Geometry, and Arithmetic including the Metric System, English, American History, and either French or German. Physics, Chemistry and General Science as well as some English History and Drawing, while not at present required for entrance, are considered to be of value in giving breadth to the mind of the student. It is hoped that whenever possible the applicant before entrance will have pursued satisfactorily a complete scientific course of study at some High School, Academy or Preparatory School.

Mathematics

Too much attention cannot be given to this division of the work, for it forms the basis upon which a larger part of the technical work is built. Little work can be done quantitatively without the aid of this adjunct. Because of the immediate application of this subject after entrance, we urge students to enter fresh from some course in their preparatory school. This can usually be accomplished by a review of the principles covered in either the first or second year of the preparatory school. While the entrance requirements in Algebra specify to Quadratic Equations, we believe it time well spent to continue this subject further and pursue that portion treated under the head of Advanced Algebra. At no distant date this part of the subject will be added to our present requirements.

Not only should the student be familiar with the usual propositions in Plane Geometry, but also many original and numerical problems should be solved, that better command in the application may be acquired.

A review of arithmetic during the year just previous to entrance will be found to be of great advantage, for the student after entrance meets new applications of this branch and unless the essentials are clear in his mind, he will for a time work at some disadvantage.

English

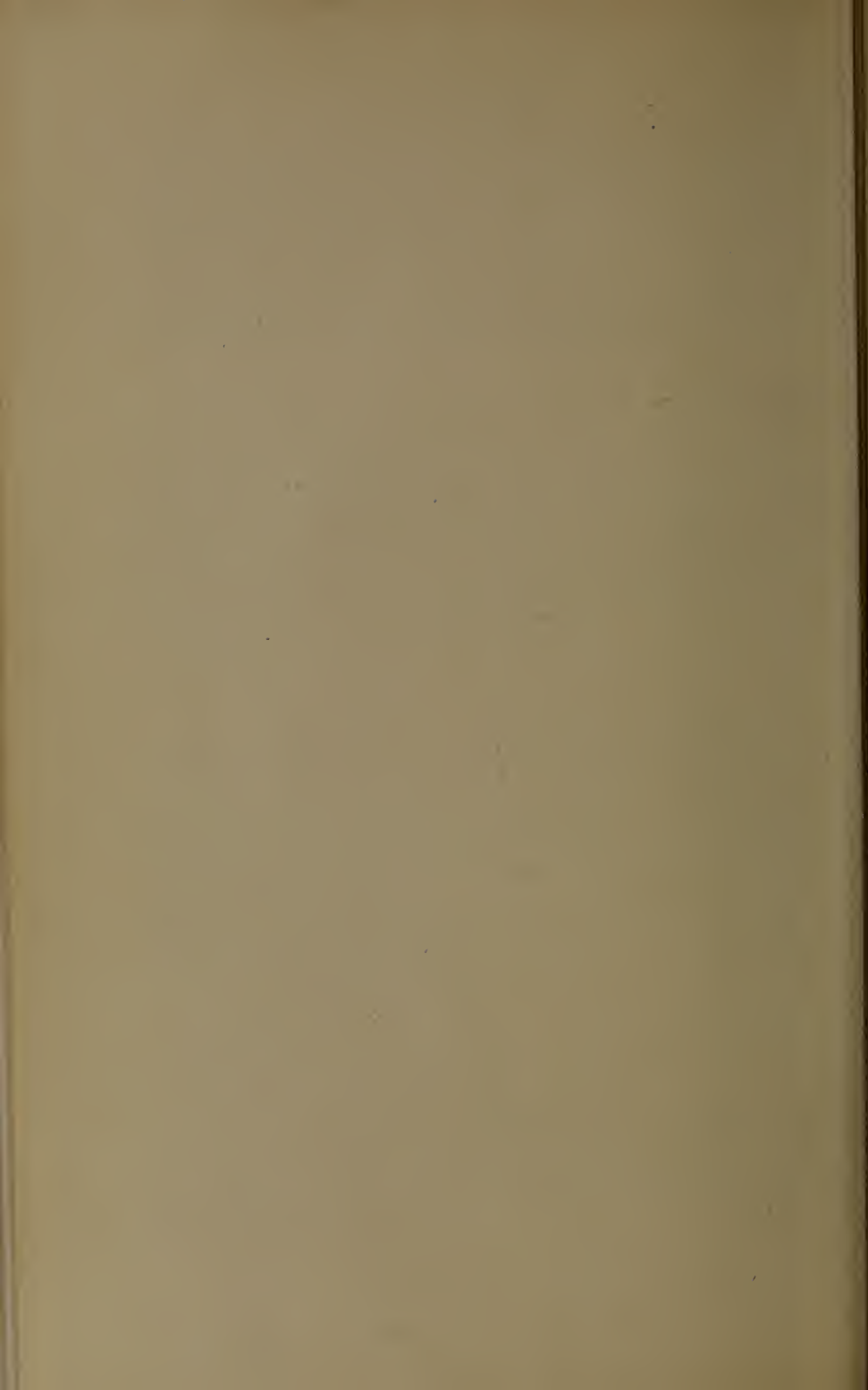
A prescribed course of reading is listed that the applicant may become acquainted with recognized standard English writers and their works, and also that these may serve to suggest subjects for themes. The theme work is considered most important, for the ability to express one's self clearly, accurately, and concisely is as necessary to highest efficiency in some positions as the technical knowledge and training. Too much attention cannot be given to theme and letter writing in the preparatory courses, to the end that the common and too frequent errors in grammar and rhetoric may, as far as possible, be eliminated.

Modern Languages

Not much more than the elementary ground work can be expected to be covered in the modern languages of French or German. These subjects are intended as aids later in the student's life by permitting him to translate articles of a technical or scientific nature that have reference to his chosen work. Importance is laid then upon the ability to translate preferably subject matter of a scientific or technical character. While the applicant is given the option of either of these languages, it is hoped that he will pursue both, as at no distant date both may be required.

History

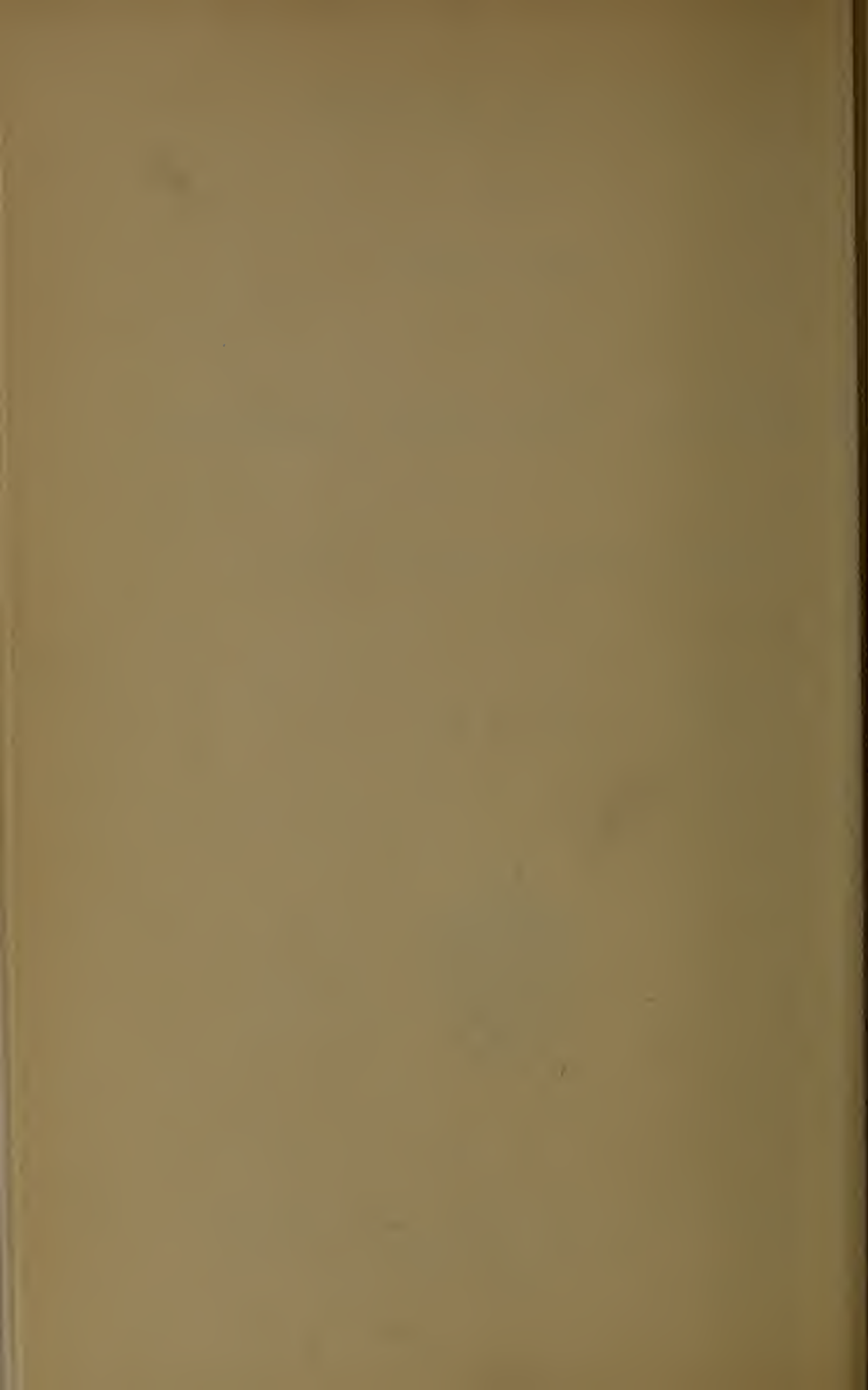
A knowledge of the events which go to make up the social, political or industrial history of our country helps the student at all times in his career to meet and better understand the ever changing conditions that in themselves make history. It is considered of primary importance that the student should be familiar with American History. A study of historical facts and events should show the co-relation between these and many institutions peculiar to our social and governmental organizations. To this end the student should include a brief course in Civil Government, such as is usually offered in any high school or academy.



ANNUAL REPORT
OF THE
TRUSTEES
OF THE
LOWELL TEXTILE SCHOOL
OF
LOWELL, MASSACHUSETTS, U. S. A.
FOR
1910



BOSTON:
WRIGHT & POTTER PRINTING CO., STATE PRINTERS,
18 POST OFFICE SQUARE.
1911.



ANNUAL REPORT OF THE TRUSTEES OF THE LOWELL TEXTILE SCHOOL FOR 1910.

To the Honorable Senate and House of Representatives of the Commonwealth of Massachusetts in General Court assembled.

The trustees of the Lowell Textile School of Lowell, Mass., respectfully submit the following report for the calendar year 1910, in compliance with chapter 248, Acts of 1904, which provides: —

SECTION 1. The trustees of every textile school receiving financial aid from the commonwealth shall, on or before the thirtieth day of January in each year, make to the general court a report containing a concise statement as to the buildings, equipment and resources of the school, the courses and methods of instruction, the number of teachers and students, if any, who graduated therefrom. The report shall also contain a statement, verified by the oath of the treasurer of the school, and in such form as the auditor of accounts of the commonwealth shall prescribe, showing separately the amounts received during the previous calendar year from tuition fees, from the commonwealth, from any city or town, and from all other sources, and also showing the expenditures of the school during the same period, under the heads of maintenance, construction, and new equipment, and also the financial condition of the school at the close of said year.

TRUSTEES OF THE LOWELL TEXTILE SCHOOL IN ACCOUNT
WITH A. G. POLLARD, TREASURER.

LOWELL, MASS., Dec. 31, 1910.

MAINTENANCE ACCOUNT.

Paid for teachers' salaries,	\$36,150 74	
for administration salaries,	6,054 90	
for employees' salaries,	6,642 10	
for general expense,	10,132 32	
for supplies,	5,333 87	
for power and light,	4,902 70	
for special service,	731 00	
for chemistry deposits,	1,183 75	
for insurance,	3,567 60	
for refund of tuition,	14 65	
		<hr/>
		\$74,713 63

Deduct ledger debits as follows:—

Cash received from chemistry deposits, . .	\$3,073 28	
from supplies, books sold, . .	2,174 63	
from special service, . .	1,010 65	
from stock sold, . .	351 92	
from use of telephone, . .	7 62	
from rebate of insurance, . .	2,805 59	
from students (breaking glass), . .	5 00	
from sale of waste paper, . .	46	
		<hr/>
		9,429 15

Net cost of maintenance for 1910, \$65,284 48

Cash received from Commonwealth of Massachusetts,	\$37,500 00	
Cash received from city of Lowell,	8,000 00	
from tuitions,	19,206 65	
		<hr/>
		\$64,706 65
Deficiency Dec. 31, 1910,		577 83
		<hr/>
		\$65,284 48

Special accounts, the expenditure of which was met from specific appropriations:—

CONSTRUCTION ACCOUNTS.

Colonial Avenue Building.

Amount received from Commonwealth of Massachusetts,	\$22,000 00	
Amount expended during 1910,		\$21,985 41
Balance on hand Dec. 31, 1910,	14 59	
		<hr/>

Boiler House (in Process of Construction).

Amount received from Commonwealth of Massachusetts,	\$8,000 00	
Amount expended during 1910,		\$8,667 36
Deficiency,	667 36	

Falmouth Street Building.

Cash on hand Jan. 1, 1910,	\$371 03	
Amount expended during 1910,		371 03

Total paid for construction, \$31,023 80

NEW EQUIPMENT ACCOUNTS.

Machine Shop, Engineering and Mechanism Account.

Cash on hand Jan. 1, 1910,	\$85 12	
Amount expended during 1910,		\$85 00
Balance carried to general equipment account,	12	

Chemistry and Dyeing Equipment Account.

Cash on hand Jan. 1, 1910,	\$1,486 63	
Amount expended during 1910,		362 15
Balance on hand Dec. 31, 1910,	1,124 48	

General Equipment Account.

Amount received from Commonwealth,	\$4,000 00	
Amount received from textile machine equipment account,	11 95	
Amount received from machine shop, engineering and mechanism account,	12	
Amount expended during 1910,		3,288 85
Balance on hand Jan. 1, 1911,	723 22	
Total paid for equipment,		<u>\$3,736 00</u>

SUMMARY OF RECEIPTS AND EXPENDITURES.

	Received.	Paid.
Cash on hand Jan. 1, 1910,	\$1,703 19	—
Maintenance,	64,706 65	\$65,284 48
Colonial Avenue building,	22,000 00	21,985 41
Boiler house (on account),	8,000 00	8,667 36
Falmouth Street building,	—	371 03
Machine shop equipment,	—	85 00
Chemistry and dyeing,	—	362 15
General,	4,000 00	3,288 85
	<u>\$100,409 84</u>	<u>\$100,044 28</u>
Loans,	41,500 00	40,000 00
Cash on hand Dec. 31, 1910,	—	1,865 56
	<u>\$141,909 84</u>	<u>\$141,909 84</u>

LOWELL TEXTILE SCHOOL.

FINANCIAL CONDITION DEC. 31, 1910.

Trial Balance Dec. 31, 1910.

	DR.	CR.
Lowell Textile School,	—	\$586,085 97
Land,	\$105,639 09	—
Machinery and equipment,	227,750 94	—
Supplies,	15,248 41	—
Notes payable,	—	50,000 00
Southwick Hall,	142,120 30	—
Kitson Hall,	31,390 91	—
Weave building,	22,150 07	—
Boiler house,	22,873 55	—
Weave wing extension,	30,061 73	—
Falmouth Street building,	15,000 00	—
Colonial Avenue building,	21,985 41	—
Cash,	1,865 56	—
	<u>\$636,085 97</u>	<u>\$636,085 97</u>

SPECIAL TRUST FUND ACCOUNT DEC. 31, 1910.

Book Prize Fund.

Amount contributed by Prof. Louis A. Olney for prizes of books to honor students in chemistry and dyeing:—

Balance on hand Jan. 1, 1910,	\$2 53	
Cash received,	60 00	
Amount paid for prizes awarded June 1910,		\$49 75
Balance on hand Jan. 1, 1911,		12 78
	<u>\$62 53</u>	<u>\$62 53</u>

The above special fund is not included in the general account.

To the Trustees of the Lowell Textile School.

This is to certify that I have examined the books of the treasurer of the Lowell Textile School for the year ending Dec. 31, 1910, and find them to be correctly kept and properly vouched.

A. A. LUDWIG,
Auditor for the Corporation.

LOWELL, MASS., Dec. 31, 1910.

LOWELL MASS., Jan. 28, 1911.

I certify that the foregoing is a correct statement of the receipts and expenditures on account of the Lowell Textile School during the calendar year 1910, and of the financial condition of the corporation at the close of said year.

ARTHUR G. POLLARD, *Treasurer,*
Trustees of the Lowell Textile School.

LOWELL, MASS., Jan. 28, 1911.

MIDDLESEX, ss.

Subscribed and sworn to before me this day.

GEORGE R. CHANDLER,
Justice of the Peace.

Approved as to form.

WM. D. HAWLEY, *Deputy Auditor.*

STATEMENT AS TO BUILDINGS, EQUIPMENT, RESOURCES, ETC.

LAND.

Land bounded by Standish, Riverside and Moulton streets, and Merrimack River and Colonial Avenue, about 14 acres,	\$105,639 09
----------------------------------------------------------------------------------------------------------------------	--------------

SCHOOL BUILDINGS.

Southwick Hall: 80 by 265 feet; three stories, with two-story wings and finished basement under all; cost,	\$142,120 30
Kitson Hall: 63 by 184 feet; one story, with basement; cost,	31,390 91
Boiler house: 63 by 68 feet; one story; cost,	14,875 16
Falmouth Street buildings: 80 by 192 feet; three stories, with basement; cost,	87,211 80
Total cost of buildings,	\$255,598 17

The floor space is divided between the departments and offices as follows:—

	Square Feet.
Cotton yarns,	12,000
Woolen and worsted yarns,	28,160
Decorative art,	1,446
Textile design,	15,360
Chemistry and dyeing,	28,400
Power weaving,	15,360
Finishing,	5,806
Mechanical and electrical engineering,	15,729
Power plant,	5,000
Administration,	2,930
Assembly and physical culture halls,	10,800
Entrances, corridors, stairways, toilets, store and locker rooms,	14,487
Total floor space in all buildings,	155,478
Cost per square foot of floor space,	\$1 78

EQUIPMENT.

Cotton yarn department,	\$33,068 32
Woolen and worsted yarn department,	41,654 42
Design department,	12,152 34
Chemistry and dyeing department,	20,892 05
Power weaving department,	19,429 35
Engineering department,	18,417 47
Physical laboratory and class room,	1,649 41
Finishing department,	13,714 11
Corridors,	227 50
Trustees' room,	881 40
Lecture hall,	494 36
General office,	658 10
Principal's office,	738 05
Janitor's rooms,	411 78
Lunch room,	220 96

Store room,	\$198 75
Library,	2,555 68
Locker room,	596 00
Students' room,	174 60
Physical culture apparatus,	505 64
Southwick Hall, heating, sprinkling and electrical system,	11,495 79
Kitson Hall, heating and sprinkling system,	1,326 90
Falmouth Street building, heating and sprinkling system,	4,466 80
Power plant,	25,246 71
Miscellaneous equipment pertaining to all buildings and departments,	16,574 45
Total,	<u>\$227,750 94</u>

The increase in value of equipment is: —

Purchased,	\$3,736 00
Contributed or made at the school,	4,934 32
Total,	<u>\$8,670 32</u>

COURSES OF INSTRUCTION.

CLASSIFICATION OF DAY STUDENTS BY COURSES.

	First Year.	Second Year.	Third Year.	Post Grad- uate.
Cotton manufacturing,	17	8	1	—
Wool manufacturing,	14	14	9	—
Textile designing,	12	4	3	—
Chemistry and dyeing,	20	21	24	—
Textile engineering,	16	10	2	—
Course not chosen,	3	—	—	49
	82	57	39	49
Total,				227

CLASSIFICATION OF EVENING STUDENTS BY COURSES.

	First Year.	Second Year.	Third Year.	Fourth Year.	Fifth Year.	Post Grad- uate.
Cotton spinning,	41	9	-	-	-	-
Woolen and worsted spinning,	43	12	6	-	-	-
Textile designing,	47	14	3	-	-	1
Chemistry and dyeing,	34	27	13	2	1	1
Weaving (cotton),	22	-	-	-	-	-
Weaving (woolen and worsted),	26	-	-	-	-	-
Weaving (dobby and Jacquard),	5	-	-	-	-	-
Mechanics,	161	-	-	-	-	-
Steam engineering,	-	21	-	-	-	-
Electricity,	-	-	14	-	-	-
Mechanical drawing,	34	-	-	-	-	-
Machine drawing,	-	15	8	-	-	-
Architectural drawing,	-	-	1	-	-	-
Freehand drawing,	21	7	4	-	-	1
Machine shop,	17	9	-	-	-	-
Finishing,	10	-	-	-	-	-
	461	114	49	2	1	3
Total,						630
Names counted twice,						40
Net total,						590

STUDENTS.

The increase in the number of day pupils over last year is 43, or 23+ per cent. The number of evening pupils is 590, against 589 last year; this slight increase is due to the lack of equipment in mechanism, especially in the machine shop. Last year we had to refuse about 50 applicants from the mills and shops, eager to take this course, who were fully qualified by previous education. They are on our waiting list for next year, or when the requisite equipment is provided.

Of the day pupils, 175 are residents of Massachusetts, 34 from other New England States, 13 from New York, New Jersey or other central States, 3 from southern States, 1 from Washington, D. C., and 1 from the Philippine Islands. Massachusetts pupils pay an annual tuition fee of \$100 or

\$125, while nonresidents pay \$150. The charge for foreigners is \$300, none of whom are on our roster. The nonresident pupils, with the possible exception of 12, are from textile centers within the commercial sphere of influence of Boston. The New York pupils are mainly from the selling houses of New England mills.

Seventy-six Massachusetts cities and towns are represented on our 1910-11 roster, an increase of 11 over last year. One hundred and ninety pupils are from high schools or academies, 24 from colleges or universities, 5 from Massachusetts polytechnic institutes, 3 from military academies, 3 from business colleges, and 1 each from Rindge Manual Training School, normal and grammar schools.

Of the evening pupils, all are from Massachusetts, 21 cities and towns being represented, an increase of 3 places.

The previous education of the evening pupils was as follows:—

Grammar schools,	330
High schools or academies (day),	151
High schools (evening),	46
Colleges and universities,	21
Business college, Lawrence industrial, technical, textile, evening drawing, normal art and preparatory schools,	42
	<hr/>
	590

For more detailed statistics, including occupation of evening pupils, see tables herewith in appendix.

NUMBER OF STUDENTS.

Jan. 1, 1910:—

Day classes,	184
Evening classes,	589
	<hr/>
Total,	773

Graduated:—

Day classes,	25
Evening classes,	76
	<hr/>
Total,	101

Jan. 1, 1911:—

Day classes,	227
Evening classes,	590
	<hr/>
Total,	817

TEACHERS.

NUMBER BY DEPARTMENTS.

Cotton yarn,	3
Woolen and worsted yarn,	4
Textile design and weaving,	7
Chemistry and dyeing,	7
Textile engineering,	4
Finishing,	1
Language and history,	1
Physical culture,	1
Post-graduate course,	1
Total,	29
Average number of students per teacher,	28

ROSTER OF SCHOOL OFFICERS AND INSTRUCTION CORPS.

PRINCIPAL.

Charles H. Eames, S.B., Massachusetts Institute of Technology, 1897. Experience: secretary of the Lowell Textile School and instructor in electrical engineering and mathematics; superintendent, Light, Heat and Power Company, Lowell, and engineer with Stone & Webster, electrical engineers, Boston, Mass.

INSTRUCTORS.

Textile Engineering.

George H. Perkins, S.B., chief instructor. Massachusetts Institute of Technology, 1899. Associate member American Society of Mechanical Engineers. Experience: draftsman, Ludlow Manufacturing Company, Ludlow, Mass.; Lockwood, Greene & Co., Boston, Mass.

Herbert J. Ball, S.B., instructor in mechanical engineering. Massachusetts Institute of Technology, 1906. Experience: draftsman, Watertown Arsenal.

Ulysses J. Lupien, S.B., instructor in mathematics, physics and electrical engineering. Lawrence Scientific School, 1906. Experience: draftsman, General Electric Company, Lynn, Mass.; with Winston Company, Metropolitan Water Board.

Felix D. Langevin, part time instructor in machine shop practice, Lowell Textile School, and assistant superintendent, Kitson Machine Shop, Lowell, Mass. Graduate Lowell Textile School, 1904.

Chemistry and Dyeing.

Louis A. Olney, A.C., M.S., chief instructor. Lehigh University, 1896. Experience: instructor, Brown University; dyeing and finishing departments, Stirling Mills, Lowell, Mass.

Miles R. Moffat, S.B., instructor in chemistry. Columbia University, 1901. Experience: assistant instructor in physics, Columbia University; chemist, Mallinckrodt Chemical Works, St. Louis, Mo.; chemist, Atlantic Mills, Providence, R. I.

Robert R. Sleeper, instructor in dyeing. Lowell Textile School, 1900. Experience: Read, Holiday & Sons, Limited, New York City; H. A. Metz & Co., New York City; Hamilton Print Works, Lowell, Mass.; Merrimack Manufacturing Company, Lowell, Mass.

Howard D. Smith, Ph.D., instructor in chemistry. Tufts College, 1906. Brown University, 1904; Rhode Island College, 1901. Experience: assistant instructor, Brown University, Tufts College; instructor, Beloit College, Wisconsin.

George A. Cushman, A.M., assistant instructor in chemistry. Harvard College, 1907.

Walter E. Hadley, assistant instructor in chemistry. Lowell Textile School, 1908.

Frank L. McCool, assistant instructor in dyeing. Lowell Textile School, 1910. Experience: Middlesex Bleach, Dye and Print Works, K. M. Gilmore & Co., Somerville, Mass.

Textile Design and Weaving.

Hermann H. Bachmann, chief instructor. Gera Textile School, Germany. Experience: Gustav Weise Public Designing House for the City of Gera; Parkhill Manufacturing Company, Fitchburg, Mass.; Lorraine Manufacturing Company and Smith Webbing Company, Pawtucket, R. I.

Arthur F. Ferguson, instructor in textile and cloth analysis. Lowell Textile School, 1903. Experience: Chapman, Kendal & Daniels, wholesale dry goods, Boston, Mass.

Stewart Mackay, instructor in hand-loom weaving. Lowell Textile School, 1906. Experience: Bay State Mills, Lowell, Mass.; George C. Moore Wool Scouring Mills, North Chelmsford, Mass.

Joseph Wilmot, instructor in power weaving and warp preparation. Lowell Textile School, 1908. Experience: United States Bunting Company, Lowell, Mass.; Draper Company, Hopedale, Mass.; Crompton & Knowles Loom Works, Worcester, Mass.

Albert E. Musard, instructor in Jacquard weaving. Experience: Oldham Mills, Philadelphia, Pa., and Paterson, N. J.; Gloucester Rug Mills, Gloucester City, N. J.; Binder & Ellis, Philadelphia, Pa.

Starr H. Fiske, assistant instructor in cotton power weaving. Lowell Textile School, 1909. Experience: Amoskeag Manufacturing Company, Manchester, N. H.

Elizabeth Whitney, instructor in freehand drawing. Normal Art School, Boston, 1882. Pupil of Dr. Denman W. Ross, lecturer in design, Harvard University. Experience: teaching eighteen years.

Cotton Yarn.

Stephen E. Smith, chief instructor. Lowell Textile School, 1900. Experience: draftsman, Lowell Machine Shop, Lowell, Mass.; Atlantic Cotton Mills, Lawrence, Mass.; Shaw Stocking Company, Lowell, Mass.

Herbert C. Wood, instructor in cotton yarns. Lowell Textile School, 1906. Experience: Tremont & Suffolk Mills, Lowell, Mass.; Whitin Machine Works, Whitinsville, Mass.

Henry K. Dick, instructor in knitting. Experience: Linnville Hosiery Factory, Lanark, Scotland.

Woolen and Worsted Yarns.

Edgar H. Barker, chief instructor. Massachusetts Institute of Technology, 1896. Experience: Pacific Mills, Lawrence, Mass.; E. Frank Lewis, Lawrence, wool scouring.

John N. Howker, instructor in wool sorting and scouring. Technical School of Saltaire, near Bradford, Eng.; certificate from City and Guilds of London. Experience: Saltaire Mills, Yorkshire, Eng.; Goodall Worsted Company, Sanford, Me.; Arlington Mills, Lawrence, Mass.

Henry H. Crompton, chief instructor in worsted yarns. Lowell Textile School, 1899. Experience: Arlington Mills, Lawrence, Mass.

Eugene C. Woodcock, instructor in woolen yarns. Lowell Textile School, 1907. Experience: Wood Worsted Mills, Lawrence, Mass.

Finishing.

Arthur A. Stewart, chief instructor. Lachine Academy, Canada; Lowell Textile School, 1900. Experience: Dominion Woolen Manufacturing Company, Montreal, Can.; American Woolen Company Mills; Nonantum Worsted Mills, Newton, Mass.; instructor woolen and worsted yarns, Lowell Textile School.

CULTURAL COURSES

Languages and History.

John Clement, A.B., instructor in commercial languages, English and history. Harvard College, 1894. Experience: reporter, Boston Evening Transcript; manager, Lamson, Wolfe & Co., publishers, Boston; editorial staff, Charles Dudley Warner's Library of the World's Best Literature, New York; International Library of Famous Literature, New York; teacher, Ballou & Hobigand Preparatory School, Boston, Mass.

Physical Culture.

Ralph E. Guillow, physical director. International Y. M. C. A. Training School, Springfield, Mass., 1910. Ten years' experience in physical culture in various schools and institutions.

Archibald R. Gardner, M.D., medical adviser. Harvard University, 1902.

Several changes during the year appear in this roster, as follows:—

George W. Hathorn, assistant instructor in dyeing, resigned, and Frank L. McCool appointed to fill vacancy.

Harold Nickerson, S.B., chief instructor in decorative art, and Fenwick Umpleby, chief instructor in textile design and weaving, resigned, the two departments consolidated, and Hermann H. Bachmann appointed as chief instructor.

Charles R. Church, physical director, resigned, and Ralph E. Guillow appointed to fill vacancy.

The following table shows the positions in the industries and commercial life our graduates held Oct. 1, 1910.

The annual catalogues show in detail the positions our graduates, both day and evening, hold and their advancement from year to year.

Director of textile school,	3
Instructor, textile or industrial school,	12
Mill corporation treasurer,	3
Mill agent,	4
Mill superintendent,	12
Mill assistant superintendent,	9
Mill assistant manager,	1
Mill foreman of department,	5
Assistant to superintendent,	7
Mill auditor and accountant,	2

Textile designer,	25
In commission house,	13
Electrician,	2
Assistant engineer,	3
Draftsman,	10
Chemist and dyer,	43
In business, textile distributing or incidental thereto,	26
Other business,	5
Trade journalist,	3
Student,	2
Machinist,	3
Physical director,	1
Weaver,	4
Second hand,	2
Wool houses,	3
Chemical salesman,	3
Minor mill positions,	9
Employment not known,	5
Deceased,	2
Total,	222

METHODS OF INSTRUCTION.

Instruction is first given in the principles of the sciences applicable to the textile and textile machinery industries, followed by instruction in the practical art, — the application of such sciences to the processes and machinery of manufacture.

Day instruction offers five four-year courses, which for evening instruction are subdivided into sixteen courses. All pupils, day and evening, are presumed to enter for the final diploma at graduation, though for the evening classes — there being but eight hours available weekly — it necessarily requires a longer time to reach the standard of acquirement than for the four-year day pupil.

Unlike most schools the same instructors serve day and evening, thus insuring to the evening pupils from the mills and shops the same able and thorough instruction as the day pupils, for it does not necessarily follow that the humbler youth should have a poor school.

All freshmen during the first half year receive the same general instruction. At the beginning of the second half they are expected to have chosen one of the five regular day courses. Each course, however, in addition to the specialty indicated by its name, includes some features of every other course, as such instruction, it is found, adds to the efficiency of the pupil in the line he has chosen.

While there are several regular courses offered, they may generally be grouped in three grand divisions, namely, textile engineering, chemistry and dyeing, and design.

Textile engineering includes the mechanism of all machinery used in all departments of the school, and also machine shop practice; instruction in the creation, transmission and application of power, whether steam, hydraulic or gas. In boiler and engine testing, for which a very complete and modern laboratory is provided, the engineers and pupils are frequently called upon, or are afforded opportunities for conducting continuous twenty-four-hour tests, without intermission, of mill power plants, including the analysis of flue gases, etc. This division also includes mill construction, cements and concrete, surveying, involving the laying out of plants, shafting, etc.; physics as involved in the testing of fibers, yarns and fabrics; mechanical drawing, plans for and the construction of equipment. The pupil is first thoroughly grounded in the principles of mechanical, electrical and hydraulic engineering before attacking the more advanced and specialized problems. The higher mathematics belong to this group. Here the plans for buildings are prepared, and all construction conducted during the summer vacation by the engineers and pupils who remain for practical experience in this line of work. Instruction is by lectures, with or without models, blackboard illustrations, mathematical problems for solution, and laboratory and shop work.

Chemistry and dyeing involves a thorough course in chemistry, followed by an applied course, first, in the laboratories, and finally, on commercial vats, presses, kiers, dryers, etc., in raw stock, yarns and fabrics. A special and growing branch is the making of dyes from raw minerals, vegetables, oils, etc. A special laboratory is equipped for testing coal and oil.

Design includes, first, instruction in color, conventionalizing of nature forms, historic ornament, etc., fundamental to all branches of decorative art, and then in the application thereof to textiles. Included under this head is all fabric weaving and finishing.

Incidental to these general divisions is instruction in English, German, French and physical culture.

The post-graduate course, established at the opening of the fall term of 1910, includes more hours in most branches now taught at the school, and advanced work, and, in addition, scientific mill management, cost-finding, corporation organization, commercial usage, essentials of contracts, banking, etc., patent office laws and practice, and advanced German.

It has for some years been growing more and more evident that our instructors and pupils were being overworked, and that even then there was not sufficient time in a three-year course to deal as thoroughly with some specialties as was desired. The post-graduate course was established to relieve the situation, and now makes all regular day courses four years. Most day pupils matriculate directly from the high schools or academies. So thorough is our instruction that they graduate directly into employment, and, as they rapidly advance to the higher responsibilities of the industry, need instruction that the school has lacked time to impart. Hence, in addition to the technique of the industry is included instruction incidental but essential to the positions they occupy or aspire to. At some technical schools and colleges it is sought to meet this need by recommending prescribed courses in reading after graduation, but this being optional with the graduate, may or may not be given attention. By limiting these subjects to essentials and making them obligatory it is thought the pupils would more certainly be benefited.

The scientific method in mill management, with special reference to "efficiency or production engineering," as presented by Taylor, Gantt, Gilbreth, Quast, Gunn, Richards, etc., mostly of the eminent Society of Mechanical Engineers, and cost-finding, are leading features of the post-graduate course," or fourth year, added to the three-year course of the three classes now at the school. The published works of these engineers, or papers specially prepared by them for this school, have been furnished the fourth-year pupils, and when they are grounded in the principles of this scientific method of management they are instructed in the methods of applying them to textile processes, and are then required to pass an examination therein.

Mindful that pragmatism, as expounded by the late Professor James of Harvard, may from the standpoint of economics be summed up in this, — that a theory is valuable only as it is found useful in application, — these papers are sent out to our graduates, already filling a great variety of positions, with the request that they use their eyes and brains and give us the benefit of their criticism and the problems they meet with.

In cost-finding two mills rarely agree, and an effort is making, with the aid of experts, to work out a system that will bring about greater uniformity.

CORPORATION SUPERVISION.

An annual meeting is held in January for the election of officers, reception of annual reports and the transaction of such other business as may be proposed, not committed to the Board of Directors. Monthly meetings at the school, of the trustees, sitting as a Board of Directors, are provided for. They appoint such agents, school officers and teachers as they find necessary, prescribe their duties and fix their compensation. The president (in his absence the vice-president) presides at all meetings of the corporation and Board of Directors, and performs such other duties and exercises such other authority as the corporation or Board of Directors may from time to time devolve on him. The treasurer is charged with the general care of the pecuniary affairs and concerns of the corporation, he to receive all revenues and make all authorized disbursements. He is required to report receipts and expenditures and financial conditions quarterly to the Board of Directors, and annually to the corporation. He is also to execute all contracts made by express authority of the corporation or Board of Directors and approved by the president. He, with the president and one elected trustee, composes a finance committee, which passes upon all orders for expenditures and inspects all bills before payment. No expenditure can be made or liability be incurred in excess of money available to meet it except by vote of the Board of Directors at a meeting in the call for which due notice of the nature of such pro-

posed expenditure or liability is given. The clerk is required to keep a record of all regular and special meetings of the corporation and Board of Directors, notify all members of such meetings seven days in advance, and perform such other duties as the corporation or Board of Directors may require of him. He is a resident trustee, devoting his time to the development work.

A corporation committee, of which the resident trustee is chairman, is charged with the organization and conduct of the post-graduate course.

In addition to the finance committee, there are general committees of ways and means, building and legislation, and lectures. There is also a subcommittee for each department of the school, composed, as far as is practicable, of trustees identified in manufacturing with the specific branch of industry to which their department relates. They are to make recommendations to the Board of Directors as to the needs, etc., of their respective departments, and especially as to the new equipment, floor space, etc., and to perform such other duties as the directors may require of them.

The principal of the school is charged with its conduct, and is directly accountable to the Board of Directors, making monthly reports thereto, and such recommendations and special reports as to efficiency, discipline, etc., as in his judgment are required.

CONCLUSION.

Each year in constructing our buildings we have brought the work more and more under the supervision of our able engineers. This year the working plans for the laboratory building on the Colonial Avenue front were all made by the engineers, and the assembling of material and daily supervision of the work have been in their charge. The outside architect and contractor have been eliminated, with the exception of the carpenter work, — roof, sash and doors. It is conceded to be the best construction job on our grounds.

Desiring light interior walls, suitable brick could not be had at less than \$28 per thousand. A brick machine was hired

the standpoint of the various positions they occupy in the industries should form a valuable contribution to the literature of the subject.

Respectfully submitted,

TRUSTEES OF LOWELL TEXTILE SCHOOL,

A. G. CUMNOCK,

President.

JAMES T. SMITH,

Corporation Clerk.

LOWELL, MASS., Jan. 30, 1911.

APPENDIX.

RESIDENCE OF DAY STUDENTS.

Adams, Mass.,	1	Methuen, Mass.,	1
Andover, Mass.,	7	Newton, Mass.,	1
Ayer, Mass.,	1	Newton Highlands, Mass.,	1
Beverly, Mass.,	1	North Adams, Mass.,	2
Blackstone, Mass.,	1	North Andover, Mass.,	5
Boston, Mass.,	8	Norwood, Mass.,	4
Bradford, Mass.,	3	Peabody, Mass.,	1
Cambridge, Mass.,	1	Pittsfield, Mass.,	1
Chelmsford, Mass.,	1	Plymouth, Mass.,	1
Chelsea, Mass.,	1	Reading, Mass.,	1
Chicopee, Mass.,	1	Revere, Mass.,	2
Clinton, Mass.,	4	Rockland, Mass.,	1
Cochituate, Mass.,	1	Roxbury, Mass.,	1
Cohasset, Mass.,	1	Salem, Mass.,	3
Concord, Mass.,	1	Saugus, Mass.,	1
Concord Junction, Mass.,	1	Segreganset, Mass.,	1
Danvers, Mass.,	2	Somerville, Mass.,	2
Dorchester, Mass.,	3	South Acton, Mass.,	1
Dracut, Mass.,	1	South Essex, Mass.,	1
East Bridgewater, Mass.,	2	Stoneham, Mass.,	1
Essex, Mass.,	2	Uxbridge, Mass.,	2
Fitchburg, Mass.,	4	Wakefield, Mass.,	1
Gardner, Mass.,	1	Waltham, Mass.,	1
Gilbertville, Mass.,	1	Ward Hill, Mass.,	1
Gloucester, Mass.,	1	Ware, Mass.,	1
Grafton, Mass.,	1	Watertown, Mass.,	3
Groton, Mass.,	1	West Medford, Mass.,	2
Haverhill, Mass.,	8	West Roxbury, Mass.,	2
Hingham, Mass.,	2	Wilmington, Mass.,	1
Holliston, Mass.,	1	Winchester, Mass.,	2
Housatonic, Mass.,	1	Winthrop, Mass.,	1
Jamaica Plain, Mass.,	2	Woburn, Mass.,	1
Lancaster, Mass.,	1	Worcester, Mass.,	3
Lawrence, Mass.,	12	Washington, D. C.,	1
Littleton, Mass.,	1	Alabama,	1
Lowell, Mass.,	24	Connecticut,	4
Lynn, Mass.,	2	Georgia,	1
Malden, Mass.,	9	Illinois,	1
Marblehead, Mass.,	1	Maine,	4
Medford, Mass.,	1	Michigan,	1
Medway, Mass.,	1	New Hampshire,	9
Melrose, Mass.,	2	New Jersey,	1
Melrose Highlands, Mass.,	1	New York,	7

RESIDENCE OF DAY STUDENTS — *Concluded.*

Ohio,	1	Wisconsin,	1
Pennsylvania,	1	Philippine Islands,	1
Rhode Island,	13		
South Carolina,	1	Total,	227
Vermont,	4		

PREVIOUS EDUCATION, DAY STUDENTS.

High school or preparatory school,	190	Rindge Manual Training School,	1
College,	18	Business college,	3
University,	6	Military academy,	2
Massachusetts Institute of Technology,	4	Normal school,	1
Worcester Polytechnic Institute,	1	Grammar school,	1
		Total,	227

RESIDENCE OF EVENING STUDENTS.

Lowell, Mass.,	450	Ballardvale, Mass.,	1
Lawrence, Mass.,	61	Chelmsford, Mass.,	1
Methuen, Mass.,	19	Needham, Mass.,	1
Andover, Mass.,	14	North Andover, Mass.,	1
North Chelmsford, Mass.,	9	Jamaica Plain, Mass.,	1
Collinsville, Mass.,	6	Melrose, Mass.,	1
Dracut, Mass.,	6	Tewksbury, Mass.,	1
Haverhill, Mass.,	5	Wellesley Hills, Mass.,	1
North Billerica, Mass.,	4	West Lynn, Mass.,	1
Forge Village, Mass.,	4		
Somerville, Mass.,	2	Total,	590
Ayer, Mass.,	1		

PREVIOUS EDUCATION, EVENING STUDENTS.

Grammar school,	330	College or university — <i>Con.</i>	
High school or academy (day),	151	Rhode Island State College,	2
High school (evening),	46	Williams College,	1
College or university:—			21
Beloit College,	1	Business college,	12
Colgate University,	1	Lawrence Industrial school,	3
Cornell University,	1	Technical school,	2
Dartmouth College,	2	Textile school,	7
George Washington University,	1	Evening drawing school,	10
Harvard University,	8	Normal school,	2
Massachusetts Agricultural College,	1	Art school,	1
Mississippi A. and M. College,	2	Preparatory school,	5
Ohio State University,	1	Total,	590

OCCUPATION OF EVENING STUDENTS.

Apprentice,	18	Master mechanic,	1
Assistant overseer,	3	Mechanic,	2
Assistant superintendent,	1	Merchant,	3
Blacksmith,	1	Milkman,	3
Bleacher,	4	Moulder,	4
Bookkeeper,	9	Not employed,	20
Boxmaker,	1	Office boy,	2
Bricklayer,	1	Oiler,	3
Candy maker,	2	Operative,	58
Carder,	1	Overseer,	9
Carpenter,	3	Painter,	2
Chemist,	3	Pattern maker,	3
Clerk,	59	Pattern weaver,	1
Cloth inspector,	6	Paymaster,	1
Color mixer,	1	Pantographer,	2
Comber,	2	Percher,	1
Contractor,	1	Photographer,	1
Creeler,	1	Plumber,	1
Cutter,	4	Polisher,	1
Designer,	3	Primer,	1
Doffer,	1	Printer,	1
Draftsman,	18	Quill winder,	1
Dresser,	2	Roll coverer,	1
Dyer,	9	Roving hand,	1
Electrician,	14	Salesman,	4
Electrotyper,	1	Second hand,	19
Engineer,	2	Section hand,	17
Engraver,	2	Shipping clerk,	2
Farmer,	1	Shoe worker,	8
Finisher,	14	Sorter,	3
Fireman,	4	Spare hand,	2
Fixer,	7	Spinner,	3
Folder,	1	Steam fitter,	2
Foreman,	2	Stenographer,	2
Gardener,	1	Stitcher,	3
Grader,	2	Student,	27
Grinder,	1	Teacher,	3
Grocer,	2	Tester,	1
Harness looker,	1	Third hand,	3
Helper,	18	Tinsmith,	3
Inspector,	2	Twister,	1
Knitter,	1	Undertaker,	1
Laboratory assistant,	1	Weaver,	24
Laborer,	4	Window trimmer,	1
Leather worker,	1	Woodworker,	1
Loom fixer,	12	Yarn hand,	1
Loom harness maker,	1		
Machinist,	86	Total,	590
Manager,	1		

TRUSTEES OF THE LOWELL TEXTILE SCHOOL.

(Incorporated 1895.)

HONORARY TRUSTEES.

FREDERICK FANNING AYER, Esq., New York City.

THE CORPORATION OFFICERS, 1911.

A. G. CUMNOCK, *President.*

JAMES T. SMITH, *Clerk.*

JACOB ROGERS, *Vice-President.*

A. G. POLLARD, *Treasurer.*

TRUSTEES.

On the Part of the Commonwealth of Massachusetts.

Ex-officiis.

HIS HONOR LOUIS A. FROTHINGHAM,
Lieutenant Governor.

DR. DAVID SNEDDEN,
Commissioner of Education.

Appointed by the Governor and Council.

FREDERICK A. FLATHER, Lowell, 1912, FRANKLIN W. HOBBS, Brookline, 1914,
Treasurer Boott Mills. Treasurer Arlington Mills.

On the Part of the City of Lowell.

Ex-officiis.

HON. JOHN F. MEEHAN,
Mayor of Lowell.

A. K. WHITCOMB,
Superintendent of Public Schools.

JAMES J. GALLAGHER,
Chairman Board of Aldermen.

HERBERT E. ELLIOTT,
President Common Council.

By Appointment of the Lowell Textile Council.

MICHAEL DUGGAN.

PERMANENT TRUSTEES.

ALEXANDER G. CUMNOCK, Lowell, Treasurer Appleton Company, Boston corporation, mills at Lowell.

EUGENE S. HYLAN, Lowell, Treasurer New England Bunting Company.

ARTHUR G. POLLARD, Lowell, President Lowell Hosiery Company.

FREDERIC S. CLARK, Boston and North Billerica, Treasurer Talbot Mills.

HON. FREDERICK LAWTON, Boston, Justice Superior Court.

THOMAS WALSH, Lowell, late Superintendent Hamilton Print Works.

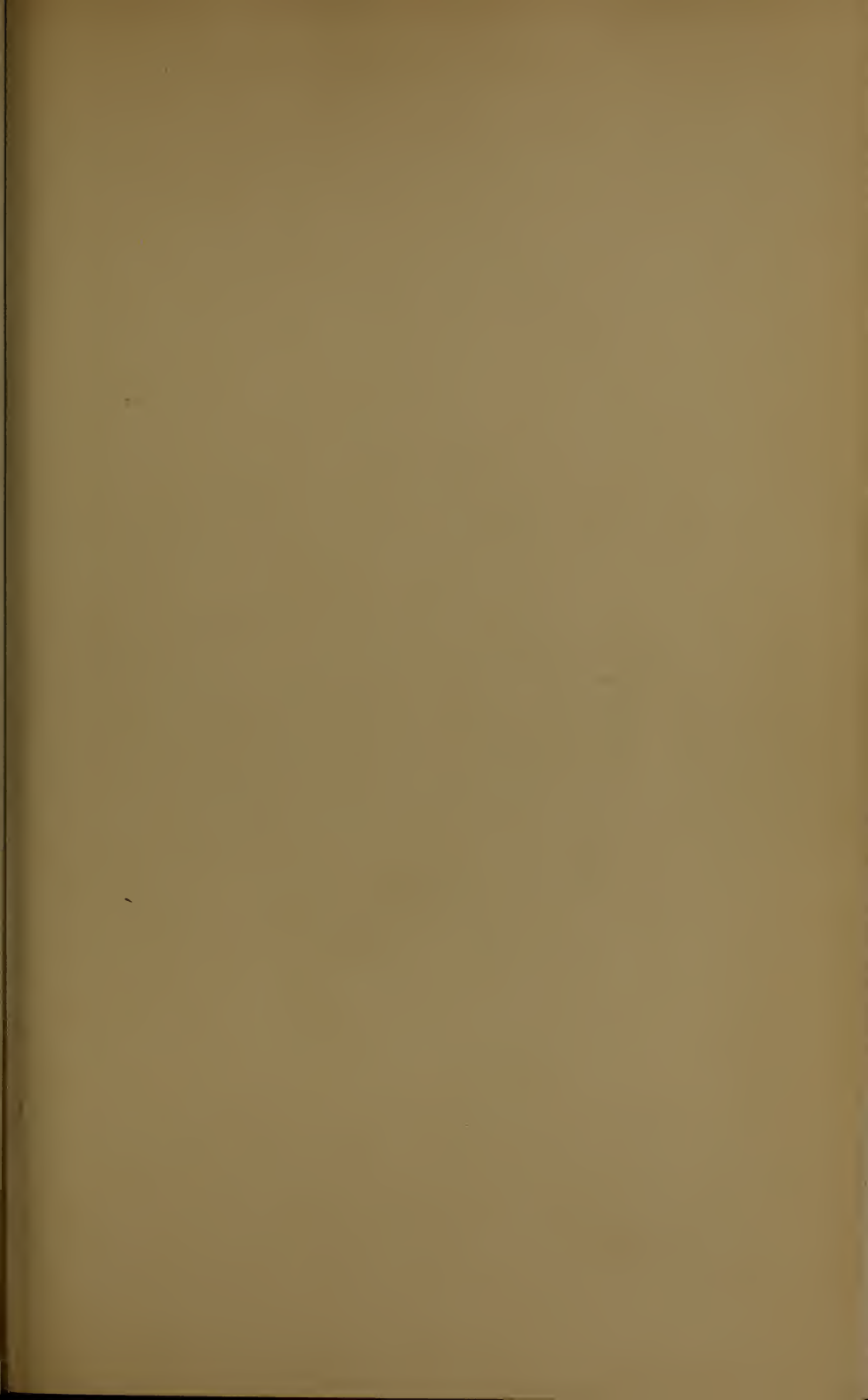
HAVEN C. PERHAM, Lowell, Treasurer Kitson Machine Shop and Lowell Machine Shop.

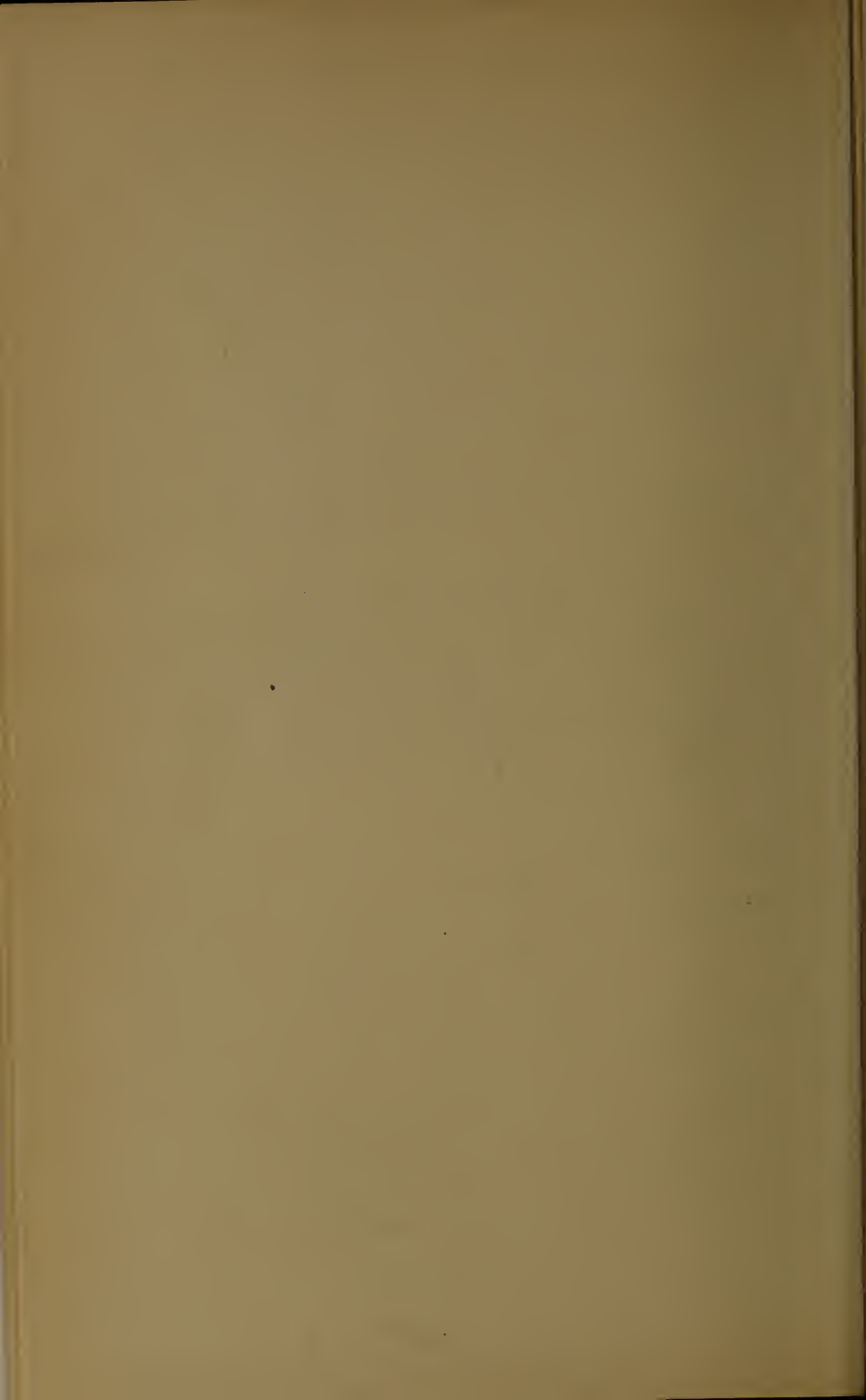
JAMES T. SMITH, Lowell, Attorney at Law.

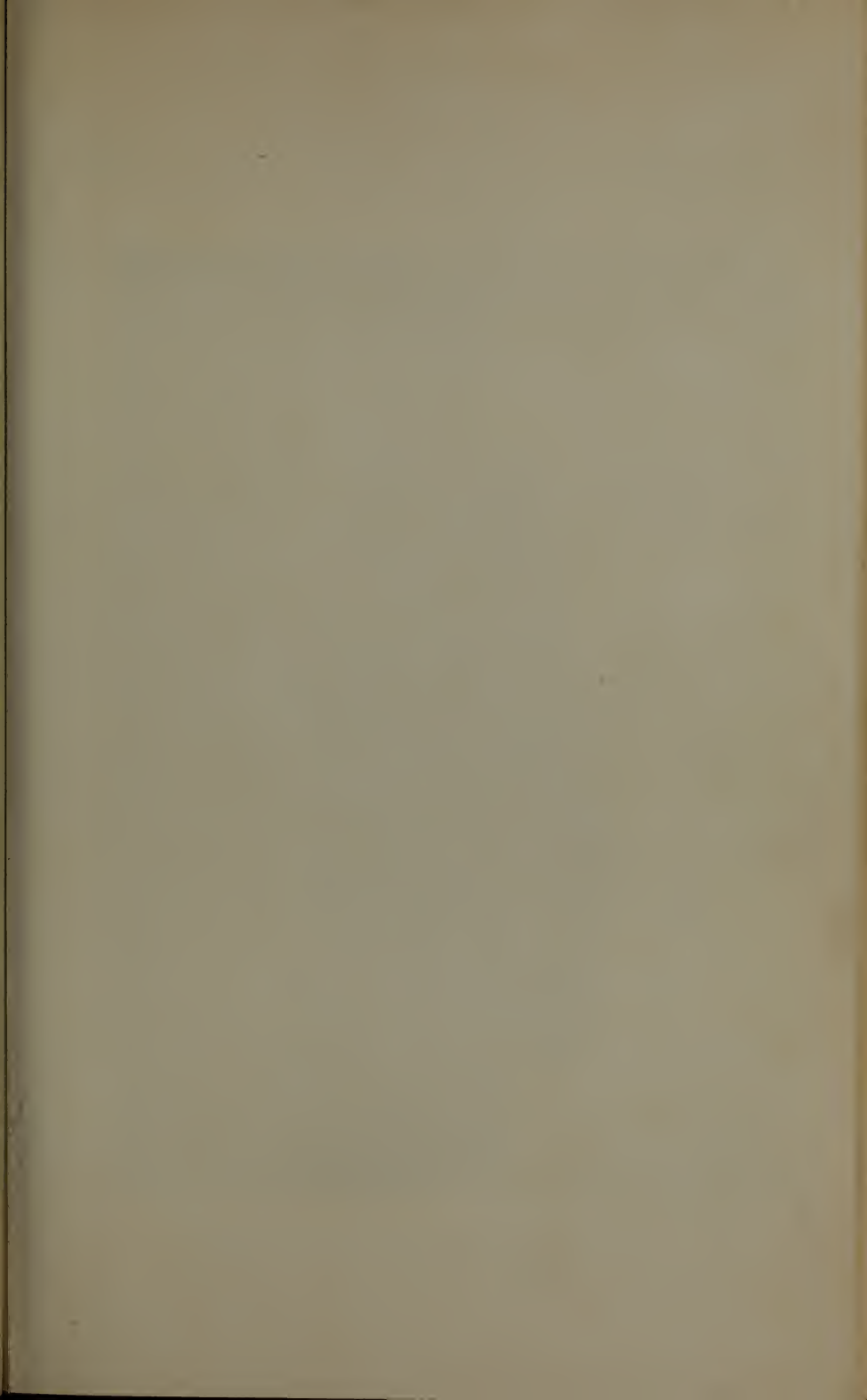
- WALTER E. PARKER, Lawrence, Agent Pacific Mills, Boston corporation, mills at Lawrence.
- WILLIAM M. WOOD, Andover, President American Woolen Company, Boston office, mills at Lawrence, Blackstone, West Fitchburg, Fitchburg, Maynard, Lowell, Plymouth, Webster, Franklin, Uxbridge.
- GEORGE E. KUNHARDT, Lawrence and New York, Woolen Manufacturer.
- FRANK E. DUNBAR, Lowell, Attorney at Law, and President Appleton Company, Boston corporation, mills at Lowell.
- JOSEPH L. CHALIFOUX, Lowell, Merchant.
- FRANKLIN NOURSE, Lowell, late Agent Lawrence Manufacturing Company, Boston corporation, mills at Lowell.
- JACOB ROGERS, Lowell, President Tremont & Suffolk Mills, Boston corporation, mills at Lowell.
- CHARLES H. HUTCHINS, Worcester, President Crompton & Knowles Loom Works.
- HENRY A. BODWELL, Andover, Superintendent Smith & Dove Manufacturing Company, class of 1900.
- WILLIAM E. HALL, Lowell, Treasurer Shaw Stocking Company.
- WILLIAM R. MOORHOUSE, Boston, Color Chemist, Cassella Color Company, class of 1901.

Additional Trustees elected by Alumni under Act of 1905.

- For term ending June 30, 1914: ROYAL P. WHITE, class of 1904, Superintendent Sterling Mills, Lowell.
- For term ending June 30, 1913: RALPH F. CULVER, class of 1904, Superintendent Holliston Mills, Norwood, Mass.
- For term ending June 30, 1912: DEXTER STEVENS, class of 1904, Yarn Superintendent, Lancaster Mills, Boston corporation, mills at Clinton, Mass.
- For term ending June 30, 1911: T. ELLIS RAMSDELL, class of 1902, Agent Monument Mills, Housatonic, Mass.









COLONIAL AVENUE BUILDING AND FALMOUTH STREET BUILDING

SOUTHWICK HALL

SERIES 14. NO. 4.

May, 1911

BULLETIN
OF THE
Lowell Textile School

LOWELL, MASS.

Issued Quarterly

1911 - 1912

Entered August 26, 1902, at Lowell, Mass., as second class matter,
under Act of Congress of July 16, 1894.

Moody Street and Colonial Avenue

CALENDAR

FOR 1911

JANUARY

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FEBRUARY

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FOR 1912

JANUARY

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FEBRUARY

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APRIL

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MAY

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JUNE

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30						

JULY

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AUGUST

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SEPTEMBER

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OCTOBER

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NOVEMBER

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DECEMBER

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22	23	24	25	26	27	28
29	30	31				

CALENDAR

January—June, 1911.

January 17, Tues.	Semi-annual examinations begin.
January 30, Mon.	SECOND TERM begins.
February 22, Wed.	Washington's Birthday—Holiday.
March 4, Sat.	End of first five-week period of second term.
April 8, Sat.	End of second five-week period of second term.
April 17, Mon. to April 19, Wed. inclusive	Recess.
May 3, Wed.	Certificates awarded to Evening Graduates.
May 18, Thurs.	Final examinations begin.
May 30, Tues.	Memorial Day—Holiday.
June 2, Fri.	Diplomas awarded to Day Graduates.
June 19 and 20, Mon. and Tues. 9 A. M.	First entrance examinations.

September, 1911—June, 1912.

September 11 and 12, Mon. and Tues.—9 A. M.	Second entrance examinations.
September 15, Fri.—9 A. M.	Re-examinations and examinations for advanced standing begin.
September 26, Tues.	DAY SCHOOL YEAR begins.
September 28, Thurs.—7 P. M.	Entrance examinations for evening students begin. They will be held on Thursday evenings until opening of classes.
October 12, Thurs.	Columbus Day—Holiday.
October 16, Mon.	Evening school year begins.
October 28, Sat.	End of first five-week period of first term.
November 29, Wed. to December 2, Sat. inclusive	Thanksgiving Recess.
December 2, Sat.	End of second five-week period of first term.
December 23, Sat. to January 2, Tues. inclusive	Christmas Recess.
January 16, Tues.	Semi-annual examinations begin.
January 29, Mon.	SECOND TERM begins.
February 22, Thurs.	Washington's Birthday—Holiday.
March 2, Sat.	End of first five-week period of second term.
April 6, Sat.	End of second five-week period of second term.
April 18, Thurs. to April 20, Sat. inclusive	Recess.
April 24, Wed.	Certificates awarded to Evening Graduates.
May 16, Thurs.	Final examinations begin.
May 30, Thurs.	Memorial Day—Holiday.
June 7, Fri.	Diplomas awarded to Day Graduates.
June 18, 19 and 20, Tues., Wed. and Thurs.—9 A. M.	First entrance examinations.

September, 1912—January, 1913.

September 9, 10 and 11, Mon., Tues. and Wed.—9 A. M.	Second entrance examinations.
September 13, Fri.—9 A. M.	Re-examinations and examinations for advanced standing begin.
September 24, Tues.	DAY SCHOOL YEAR begins.
September 26, Thurs.—7 P. M.	Entrance examinations for evening students begin. They will be held Thursday evenings until opening of classes.
October 12, Sat.	Columbus Day—Holiday.
October 14, Mon.	Evening school year begins.
October 26, Sat.	End of first five-week period of first term.
November 27, Wed. to November 30, Sat. inclusive	Thanksgiving Recess.
November 30, Sat.	End of second five-week period of first term.
December 23, Mon. to January 4, Sat. inclusive	Christmas Recess.



SOUTHWICK HALL

KITSON HALL AND CAMPUS

Trustees of the Lowell Textile School

(Incorporated 1895)

Honorary Trustee

FREDERICK FANNING AYER

New York City

The Corporation

Officers, 1911

A. G. CUMNOCK, PRESIDENT

JAMES T. SMITH, CLERK

JACOB ROGERS, VICE-PRESIDENT

A. G. POLLARD, TREASURER

Trustees

On the part of the Commonwealth of Massachusetts

Ex-Officiis

HIS HONOR LOUIS A. FROTHINGHAM

Lieutenant Governor

Appointed by the Governor and Council

DR. DAVID SNEDDEN

Commissioner of Education

FREDERICK A. FLATHER, Lowell, 1912

Treasurer Boott Mills

FRANKLIN W. HOBBS, Brookline, 1914

Treasurer Arlington Mills

On the part of the City of Lowell

Ex-Officiis

HON. JOHN F. MEEHAN

Mayor of Lowell

A. K. WHITCOMB

Superintendent of Public Schools

JAMES J. GALLAGHER

Chairman Board of Aldermen

HERBERT E. ELLIOTT

President Common Council

By appointment of the Lowell Textile Council

MICHAEL DUGGAN

Permanent Trustees

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EUGENE S. HYLAN, Lowell, Treasurer New England Bunting Company

ARTHUR G. POLLARD, Lowell, President Lowell Hosiery Company

FREDERIC S. CLARK, Boston and North Billerica, Treasurer Talbot Mills

HON. FREDERICK LAWTON, Boston, Justice Superior Court

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JAMES T. SMITH, Lowell.

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WILLIAM M. WOOD, Andover, President American Woolen Company, Boston Office, Mills at Lawrence, Blackstone, West Fitchburg, Fitchburg, Maynard, Lowell, Plymouth, Webster, Franklin, Uxbridge.

GEORGE E. KUNHARDT, Lawrence and New York, Woolen Manufacturer

FRANK E. DUNBAR, Lowell, President Appleton Co., Boston Corporation, Mills at Lowell.

JOSEPH L. CHALIFOUX, Lowell, Merchant

FRANKLIN NOURSE, Lowell, Late Agent Lawrence Manufacturing Co., Boston Corporation, Mills at Lowell.

CHARLES H. HUTCHINS, Worcester, Pres. Crompton & Knowles Loom Wks.

JACOB ROGERS, Lowell, President Tremont & Suffolk Mills, Boston Corporation, Mills at Lowell.

HENRY A. BODWELL, Andover, Supt. Smith & Dove Mfg. Co. Class of 1900

WILLIAM E. HALL, Lowell, Treasurer Shaw Stocking Company

WILLIAM R. MOORHOUSE, Boston, Color Chemist, Cassella Color Company. Class of 1901.

CHARLES F. YOUNG, Lowell, Treasurer Tremont & Suffolk Mills, Boston Corporation, Mills at Lowell.

JOHN JACOB ROGERS, Attorney-at-law, Lowell.

Additional Trustees Elected by Alumni Under Act of 1905

For Four Years, from June 30, 1907.

T. ELLIS RAMSDALL, Class of 1902, Agent Monument Mills, Housatonic, Mass.

For Four Years, from June 30, 1908.

DEXTER STEVENS, Class of 1904, Yarn Superintendent, Lancaster Mills, Clinton, Mass., Boston Corporation, Mills at Clinton.

For Four Years, from June 30, 1909.

RALPH F. CULVER, Class of 1904, Superintendent Holliston Mills, Norwood, Mass.

For Four Years, from June 30, 1910.

ROYAL P. WHITE, Class of 1904, Superintendent Stirling Mills, Lowell, Mass.



GENERAL VIEW OF SCHOOL, MERRIMACK RIVER

GENERAL COMMITTEES

FINANCE

A. G. CUMNOCK, Chairman A. G. POLLARD F. A. FLATHER
CHARLES F. YOUNG

BUILDING AND LEGISLATIVE

A. G. CUMNOCK, Chairman A. G. POLLARD JAMES T. SMITH
FREDERICK A. FLATHER WILLIAM E. HALL JACOB ROGERS
FREDERIC S. CLARK JOHN J. ROGERS FRANKLIN NOURSE
HENRY A. BODWELL FRANKLIN W. HOBBS JOSEPH L. CHALIFOUX

WAYS AND MEANS

JAMES T. SMITH, Chairman FRANKLIN W. HOBBS
FREDERIC S. CLARK WALTER E. PARKER
ROYAL P. WHITE

LECTURES

FRANKLIN NOURSE, Chairman HENRY A. BODWELL
FRANKLIN W. HOBBS JAMES T. SMITH
THOMAS WALSH FREDERIC S. CLARK
JOHN J. ROGERS

DEPARTMENT COMMITTEES

Cotton Spinning

FRANKLIN NOURSE, Chairman WILLIAM E. HALL
T. ELLIS RAMSDELL DEXTER STEVENS

Woolen and Worsted Spinning

FRANKLIN W. HOBBS, Chairman FREDERICK A. FLATHER
WALTER E. PARKER

Chemistry and Dyeing

THOMAS WALSH, Chairman FREDERIC S. CLARK
WILLIAM R. MOORHOUSE

Decorative Art

JAMES T. SMITH, Chairman FREDERICK LAWTON

Designing, Weaving and Finishing

FREDERIC S. CLARK, Chairman ROYAL P. WHITE
DEXTER STEVENS

Mechanical and Electrical Engineering

HENRY A. BODWELL, Chairman FRANKLIN NOURSE

Athletics

JAMES T. SMITH, Chairman
WILLIAM R. MOORHOUSE ROYAL P. WHITE



ADMINISTRATION

CHARLES H. EAMES, S. B., Principal of the School

Chiefs of Departments

LOUIS A. OLNEY, A. C., M. S.

Professor of Chemistry; in charge of Department of
Chemistry and Dyeing

EDGAR H. BARKER,

In charge of Department of Woolen and Worsted
Yarns

GEORGE H. PERKINS, S. B.

In charge of Department of Textile Engineering

ARTHUR A. STEWART,

In charge of Department of Finishing

STEPHEN E. SMITH,

In charge of Department of Cotton Yarns and
Knitting

HERMANN H. BACHMANN,

In charge of Department of Design and Power
Weaving

Instructors

ARTHUR F. FERGUSON,

Instructor in Textile Design and Cloth Analysis

JOSEPH WILMOT,

Instructor in Power Weaving and Warp Preparation

JOHN N. HOWKER,

Instructor in Wool Sorting and Scouring

STEWART MACKAY,

Instructor in Hand Loom Weaving

ROBERT R. SLEEPER,

Instructor in Dyeing

HERBERT J. BALL, S. B.,

Instructor in Mechanical Engineering

HENRY H. CROMPTON,

Instructor in Worsted Yarns



COTTON YARN DEPARTMENT

Instructors—Continued

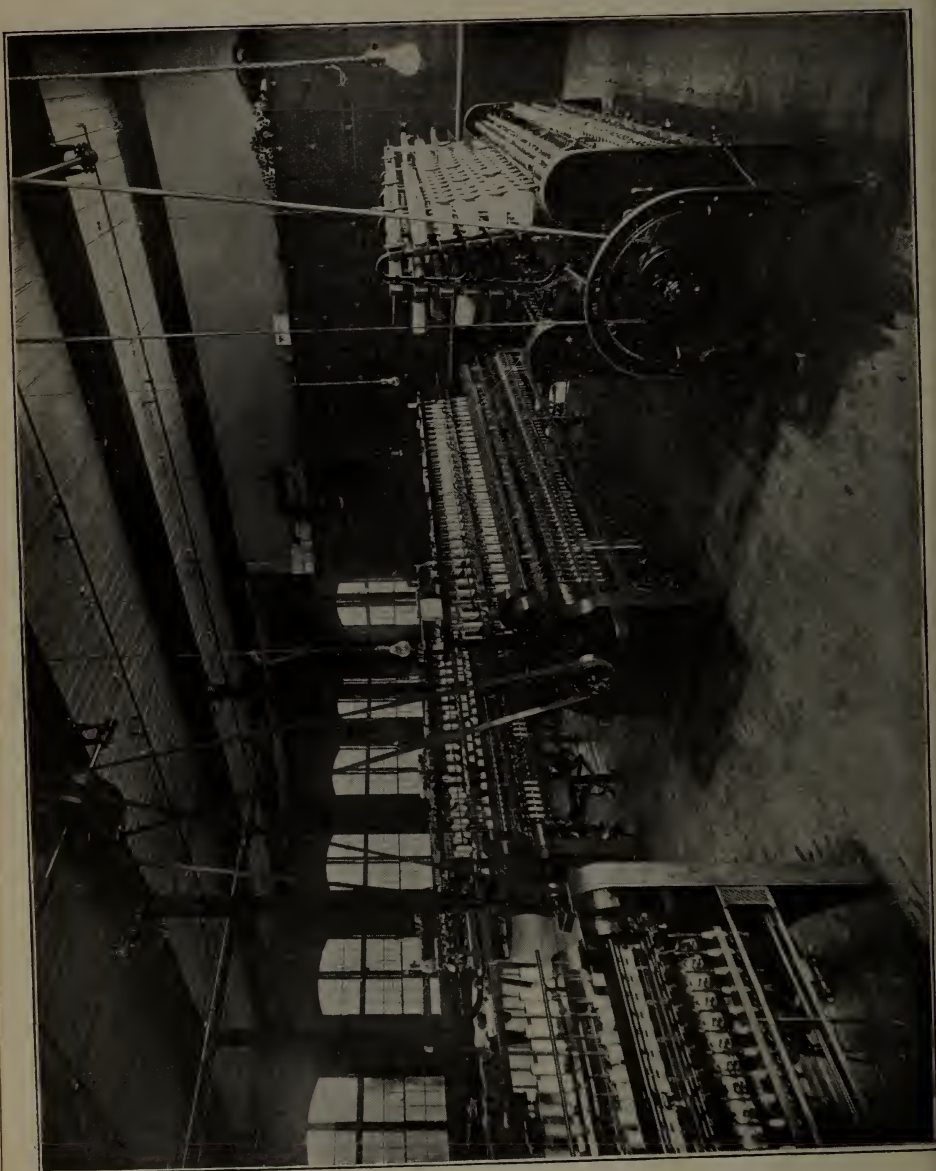
- ELIZABETH WHITNEY,
Instructor in Freehand Drawing
- ULYSSES J. LUPIEN, S. B.,
Instructor in Mathematics, Physics and Electrical
Engineering
- MILES R. MOFFATT, S. B.,
Instructor in Chemistry
- HOWARD D. SMITH, PH. D.,
Instructor in Chemistry
- ALBERT E. MUSARD,
Instructor in Jacquard Weaving
- EUGENE C. WOODCOCK,
Instructor in Woolen Yarns
- GEORGE A. CUSHMAN, A. M.,
Instructor in Chemistry
- HERBERT C. WOOD,
Instructor in Cotton Yarns
- FRANK L. MCCOOL,
Assistant Instructor in Dyeing
- WALTER E. HADLEY,
Instructor in Chemistry
- JOHN CLEMENT, A. B.,
Instructor in Commercial Languages, English and
History
- FELIX D. LANGEVIN,
Instructor in Machine Shop Practice
- HENRY K. DICK,
Instructor in Knitting
- STARR H. FISKE,
Assistant Instructor in Weaving
- RALPH E. GUILLOW,
Instructor in Physical Culture
- ARCHIBALD R. GARDNER, M. D.,
Medical Adviser

Faculty

CHARLES H. EAMES

LOUIS A. OLNEY
EDGAR H. BARKER
GEORGE H. PERKINS

STEPHEN E. SMITH
ARTHUR A. STEWART
HERMANN H. BACHMANN



The Lowell Textile School

The Lowell Textile School was established, and is managed, by the Trustees of the Lowell Textile School of Lowell, Massachusetts, "for the purpose of instruction in the theory and practical art of textile and kindred branches of industry," as set forth in the act of incorporation.

The movement for the establishment of the School dates from June 1, 1891, but it was not opened for instruction until February 1, 1897.

Not only did the normal progress of the textile industry require such a school, but through the rapid development of the manufacture of the coarser cotton fabrics in the southern states, a crisis had arrived in the leading industry of New England which could only be met by wider and more thorough application of the sciences and arts for the production of finer and more varied fabrics.

Modeled on the lines of the departments of the higher Polytechnic Institutes, it offers thorough instruction in the elements and principles of the sciences and arts applicable to textile and kindred branches of industry and also in their application to the manufacturing of all varieties of textile fabrics, and the machinery required therefor.

In industrial education the distinction between Trade and Technical Industrial Schools is coming to be understood. The Lowell School belongs to the latter class. Beginning with limited equipment, instruction staff, and means, instruction at first was by Mill or Trade school methods—the pupil was brought directly to the machine, its parts explained to him, and its operation in manufacturing. The curriculum was, however, rapidly extended, as contemplated in the original plan, department after department opened and equipped, and commodious and well adapted buildings provided for a permanent home.



COTTON COMBING

While the progress of invention and the demands of ever changing markets will compel constant improvement in methods and additions to the very extensive equipment, the period of establishment is substantially closed. All departments are open for instruction in all branches of the textile art under extensive and able corps of instructors and assistant instructors.

Of the incorporators the permanent trustees (limited to twenty) are mainly representatives, as president, treasurer, agent, or superintendent, of the management of great textile or textile machine corporations of the Commonwealth, and associated with them are, ex-officiis, His Honor, the Lieutenant Governor and the Commissioner of the State Board of Education, and two trustees appointed for four-year terms by the Governor and Council. Also the Mayor, Superintendent of Schools, the presiding officers of the two branches of the City Council, and a representative of the textile council of the city of Lowell. At the session of 1905 the Legislature authorized the graduates of the school to elect two additional trustees, and by an act of 1906 the number was increased to four for four-year terms, one being elected each year.

By the terms of the by-laws at least three-fourths of the permanent trustees must be persons "actually engaged in or connected with textile or kindred manufactures."

Lowell, Massachusetts, is called the "Mother Textile City of America," and in locating the school at this center a considerable advantage is secured for the reason that every commercial fibre is utilized in the products of the great Merrimack Valley Textile district. The practical work of the school is therefore kept closely in touch with the several branches of the industry which are included in the courses of study.

His Excellency, Governor Roger Wolcott, formally opened the school on January 30, 1897, there being present a large and representative gathering of gentlemen from the textile industries in all portions of New England. The regular classes of the school were opened on February 1, 1897, and have been regularly conducted since that time.

His Excellency, Governor John L. Bates, dedicated the buildings forming the permanent home of the school on February 12,



1903, in the presence of a large number of guests representing the Legislature as well as the educational, textile, and commercial interests of the Commonwealth.

Experience has demonstrated that applicants for day instruction should enter more thoroughly prepared, and it now seems advisable that all such students should have had preparatory training, the equivalent of that afforded by the regular four-year course of a standard high school. Even in such cases it is necessary to include in the curriculum of this school primary instruction in branches of General Chemistry, Decorative Art, Mechanics and Mechanical Drawing. These subjects must be taught in a most thorough manner, for upon these depend the value and standing of the graduates in the great textile industries. Evening pupils must have had the equivalent of a grammar school course. While one may acquire at the school thorough knowledge of the principles of the sciences applicable in widely diverse lines of industry, the principles of science and art are taught with the particular view to their application to textile problems and processes. For graduates of universities and scientific institutions, special applied textile courses are offered to those who have had the proper preparatory training.

The mechanical equipment of the school includes the best makes of textile machinery, and these machines, while built as they would be for regular work, are, so far as possible, adapted to the experimental work which is of particular value in such an institution as this.

There is a more varied equipment in this school than in any other, either in America or Europe, and it is now possible to convert the raw stock into the finished fabric, within the school.

The growth of the school has been constant, as is evident from the fact that when it was opened February 1, 1897, there were 32 day and 110 evening pupils. January 1, 1911, the roster showed 227 day pupils and 590 evening pupils or 817 in all. The annual per cent. of increase for the preceding years is twenty-three per cent.

On January 1, 1903, the School was transferred from the rented quarters that it had occupied for five years to the site and buildings where it is permanently located.



WOOLEN AND WORSTED YARN DEPARTMENT

The site is a commanding one, consisting of about eighteen acres at a high elevation, on the west bank of the Merrimack River, extending to and overlooking the rapids of Pawtucket Falls, the first to be utilized for power weaving in America on an extensive scale. This site was contributed by Frederick Fanning Ayer, Esq., of New York City, and the Proprietors of the Locks and Canals on the Merrimack River. To this site has been added three acres through the continued liberality of Mr. Ayer. The buildings consist of Southwick Hall, Kitson Hall, the Falmouth Street Building and Colonial Avenue laboratories, and present plans contemplate additions during 1911.

Southwick Hall includes a central mass 90 x 90 ft., having three stories and two wings 80 x 85 ft. with two stories and a well lighted basement. The building is pierced in the center by an arched way from which access is had to the wings and to the central courtyard. The northern wing is occupied by the General Offices, Engineering and Finishing Departments, and Library, while the southern wing is entirely occupied by the Chemistry and Dyeing Departments. In the basement is located an Industrial Chemistry Laboratory for the manufacture of dyes from the crude material.

Kitson Hall makes a right angle with Southwick Hall and is 60 x 252 ft. with one story and a basement. It is occupied by the Cotton Yarn Department and heating, lighting, ventilating and power plant. The capacity of Kitson Hall was recently doubled permitting of an extension of the Finishing Department, a Mechanical Engineering Laboratory, a Machine Shop, Students' Athletic Rooms, Store Rooms, etc.

Falmouth Street buildings form the third side of the quadrangle and consist of two portions, one 75 x 130 ft., three stories, and the head house 70 x 80 ft., three stories and basement. This building is occupied by the Departments of Weaving and Wool Yarns. The head house is occupied by these departments, and contains equipment for French Spinning, Warp Preparation, Wool Scouring, Carbonizing and Conditioning. The upper floor contains the Textile Design Department.

Colonial Avenue Building was erected in the summer of 1910 from plans prepared by the Engineering Department. The work



WOOLEN AND WORSTED YARN DEPARTMENT

of construction was also in charge of the engineers of this department. The building completes the fourth side of the quadrangle and in outward appearance corresponds to the architectural features of the other school buildings. It is a single story building and has the dimensions of 195 x 60 ft. Its interior is faced with cement brick made at the school during the progress of the work. These serve to give light reflecting walls which are advantageous for the work of the Wool Manufacturing and Chemistry and Dyeing Departments that occupy this building.

The buildings are all faced with light brick with granite and Indiana lime stone trimmings and are of modern mill construction adapted to educational uses. The floor space of the School is quadrupled in the new home, permitting of a very large increase in equipment and is now occupied by the several departments as follows:

Cotton Yarns and Knitting	12,000 sq. ft.
Woolen and Worsted Yarns	28,160 " "
Decorative Art and Textile Design	16,806 " "
General Chemistry and Dyeing Laboratories	28,400 " "
Finishing	5,806 " "
Power Weaving	15,360 " "
Mechanical and Electrical Engineering	15,729 " "
Physical Culture	7,200 " "

The additional floor space is devoted to Administration Offices, Library, Assembly Halls, Class Rooms, Store Rooms, Power, Heating and Ventilating Plant, etc.

Southwick Hall was contributed by the Commonwealth of Massachusetts and Frederick Fanning Ayer, Esquire, of New York City, and is a memorial to Royal Southwick, a leading textile manufacturer, a public man of earlier days, and a maternal ancestor of Mr. Ayer.

Kitson Hall, dedicated to the memory of Richard Kitson, was contributed by Charlotte P. Kitson and Emma K. Stott, his daughters; the Kitson Machine Company of Lowell, founded by Mr. Kitson, was also a generous contributor.



WOOLEN YARN DEPARTMENT

Though from the first the management has kept in view the clearly defined objective which called for the establishment of the school, namely, the needs of the textile and kindred industries, it has developed its curriculum, its instruction methods, and equipment as those needs arose or became evident. At this writing its chemical and dyeing, decorative art, design, yarn and weaving departments are liberally housed, equipped, and provided with able instructors for the highest efficiency, though additional floor space is required and is being provided as the roster of pupils increases. The demand for a very large addition to the mechanism, machine shop, and power production and application branches embraced by the title "Textile Engineering" was supplied in 1908. Within the last two years large additions of floor space have been made to the Design Department, the Woolen and Worsted, and the Chemistry and Dyeing Laboratories.

DAY CLASSES

These are especially intended for the instruction of those who contemplate entering the business of textile manufacturing in any branch. The courses are sufficiently complete to enable one to start without any previous acquaintance with textiles; but at the same time those who have been engaged in such business and wish to improve their knowledge and experience, can with profit pursue a course of study at the school.

Each course covers a period of three years, at the satisfactory completion of which the regular diploma of the school is awarded. It is very probable that within the coming two or three years a four year course will be offered in some of the departments. At the completion of such course a proper degree will be granted.

Following a description of the various three year courses will be found a Post-graduate course in Textile Engineering open to all students who hold a diploma of the school covering work in any of the manufacturing or engineering courses. There is also offered a Post-graduate course in Chemistry and Dyeing. This is open to all students who hold a diploma of the school in



WOOL SCOURING AND CARBONIZING

the department of Chemistry and Dyeing. The satisfactory completion of any of these courses will make the student eligible to a degree when offered later by the school.

There is one term of preliminary instruction, which is common to all courses. At the end of this term, each student is required to select the course he is to follow in his subsequent studies, and the instruction given from this point is specialized to suit each course.

The five regular diploma courses are:

- I. Cotton Manufacturing.
- II. Wool Manufacturing.
- III. Textile Design.
- IV. Chemistry and Dyeing.
- VI. Textile Engineering.

EVENING CLASSES

It is intended to give evening instruction to those who are engaged during the day in mills and work shops, to enable them to perfect their knowledge of the branches in which they work, to acquire knowledge of other processes than those in which they are regularly engaged, and to pursue in the course of several winters, a thorough technical education without interfering with their daily duties.

The courses offered are similar to those of the day; but less time is devoted to the machine or laboratory work, since in most cases this is of small moment. Ordinarily the handling of the machinery is a part familiar to most of the students through contact with it in the day time, and in such cases the explanations and calculations are of the greater importance. In some cases it is possible to pursue two courses together, but this depends always on the arrangement of the schedule for any particular year.

All Evening Courses are free to residents of Lowell. All applicants must present satisfactory credentials showing that they are graduates of a Grammar School or school of higher standing,



WORSTED CARD

or they must pass entrance examinations in Arithmetic and English. For the latter subject a short composition must be written on a given theme, and a certain amount must be written from dictation. In arithmetic the applicant must show suitable proficiency in addition, subtraction, multiplication, division, common and decimal fractions, percentage, ratio and proportion.

Courses are offered in:

- I. Cotton Spinning—2 years.
- II. (a) Woolen Spinning—2 years.
(b) Worsted Spinning—3 years.
- III. (a) Textile Design—3 years.
(b) Freehand Drawing—3 years.
- IV. Chemistry and Dyeing.
 - (a) Elementary Chemistry—2 years.
General Chemistry including Inorganic and Organic.
Qualitative Analysis.
 - (b) Textile Chemistry and Dyeing—3 years.
Lectures in Textile Chemistry and Dyeing.
Laboratory Work in Dyeing.
 - (c) Analytical Chemistry—3 years.
Laboratory Work and Lectures in Quantitative Analysis.
 - (d) Textile and Analytical Chemistry—4 years.
Lectures in Textile Chemistry and Dyeing.
Laboratory Work in Analytical Chemistry.

In order to take Course (b), (c) or (d), candidates must have certificate from Course (a), or show by examination or approved credentials that they have taken the equivalent work covered by this course.

- V. (a) Cotton Weaving—1 year.
(b) Woolen and Worsted Weaving—1 year.
(c) Dobby and Jacquard Weaving—1 year.



FRENCH SPINNING DEPARTMENT

VI. Elements of Engineering—3 years.

Mechanics.

Steam.

Electricity.

Machine Shop—2 years.

Mechanical Drawing—3 years.

VII. Woolen and Worsted Finishing—1 year.

List of subjects embraced in each course is similar to that of the day and may be found beginning on page 95.

For the satisfactory completion of any of the above numbered courses, the certificate of the school will be awarded; providing, however, that the student has been in attendance in the course and during the year for which the certificate is granted; the diploma of the school will be awarded in exchange for certificate of satisfactory completion of those subjects which go to make up any one of the regular diploma courses.

No diploma or certificate will be awarded until all dues to the school have been discharged.

Fee for each course for all except residents of Lowell, is \$5.00 per year payable in advance. All students, whether from Lowell or not, taking course (a) Chemistry and Dyeing Department, are required to make a deposit of \$5.00 at the commencement of the course. A deposit of \$10.00 will be required of all students taking courses (b), (c) and (d). This is to cover the cost of laboratory breakages, and at the end of the year any unexpended balance is returned or an extra charge made for the excess breakage.

The schedule showing the arrangements of classes for each term will be announced at the opening of each term.

WOMEN'S DEPARTMENT

Among the many fields in which woman has entered, none has been found in which her natural refinement of taste and skill can be used to better advantage than in designing; but natural



FRENCH SPINNING DEPARTMENT

ability, though the prime requisite, is by no means all, for a certain amount of technical knowledge must be gained to achieve success. This department combines decorative art and textile design, and regular attendance is required as in other departments.

EQUIPMENT

The equipment of machinery, inventoried January 1, 1911, at \$227,750.94, is the most varied for textile educational purposes, and it being constantly augmented. The builders of the various machines installed keep in close touch with the school, adding to the machines such improvements as are made from time to time. This operates to mutual advantage of student and manufacturer.

COTTON DEPARTMENT

Ginning

- One 50 saw gin made by Daniel Pratt Gin Co., Prattsville, Ala.
- One Prior Roller Gin.

Opening, Picking and Waste Machinery

An outfit of Kitson Picking Machinery from works of Kitson Machine Co., Lowell, Mass., including:

- One No. 7 Opener with Automatic Feeder connected by Perham patent Cleaning Trunk to
- One 40 in. Single Beater Breaker Lapper with Condenser and gauge box feed.
- One 40 in. Single Beater Intermediate Finisher Lapper with Perham & Davis Sectional Plate Evener, apron to double four laps.
- One 40 in. Single Beater Finisher Lapper with Perham & Davis Sectional Plate Evener, apron to double four laps, Kirschner Patent Carding Beater.
- One Roving Waste Opener.
- One Thread Extractor.

Carding, Combing and Drawing

The following machinery made by the Lowell Machine Shop, Lowell, Mass.

- One Top Flat Card.
- Three Revolving Flat Cards.
- Two Railway Heads.
- Two Drawing Frames.

One of these cards is equipped with the Chapman Electric Neutralizer, made by The Chapman Electric Neutralizer Co., Portland, Me.



WOOL SORTING

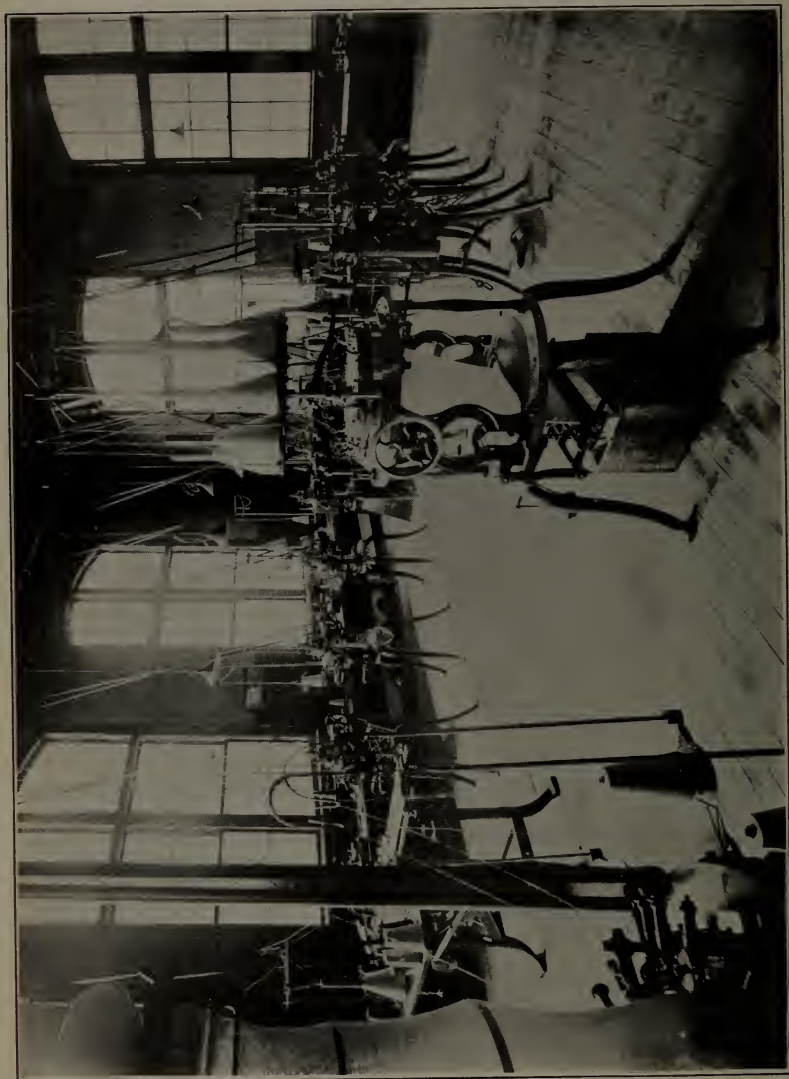
From Kitson Machine Company
Stripping Rolls, etc.
From the Whitin Machine Works, Whitinsville, Mass.
One 40 in. Revolving Flat Card.
Card Grinding Rolls.
One Sliver Lapper.
One Six Head Ribbon Lapper.
One Four Head Ribbon Lapper.
One Six Head Comber.
One Eight Head High Speed Comber.
From the Mason Machine Works, Taunton, Mass.
One Sliver Lap Machine.
One Comb.

Roving, Spinning and Twisting

From Lowell Machine Shop, Lowell, Mass.
One Slubber.
One Intermediate.
One Fine Frame.
One Jack Frame.
Three Ring Spinning Frames.
One Spinning Mule.
One Spooler.
One Wet and Dry Twister.
From Fales & Jenks, Pawtucket, R. I.
One Wet and Dry Twister.
From Draper Company, Hopedale, Mass.
One Wet and Dry Twister.
From Whitin Machine Works, Whitinsville, Mass.
Two Ring Spinning Frames.
From Woonsocket Machine and Press Co., Woonsocket, R. I.
One Intermediate Fly Frame.
From Asa Lees Co., Oldham, Wm. Firth Company, Agents.
One Mule for fine spinning.

Miscellaneous Machinery of this Department includes:

From the Lowell Machine Shop, Lowell, Mass.
One Reel.
One Model Fine Fly Frame.
One Model Fly Frame Compound.
One Model Card Feed.
One Model Flat Grinding Device.
One Model Scroll Setting Device.
From The Universal Winding Company.
One Six head Universal Winder, for cones, tubes or multiple winding.



KNITTING DEPARTMENT

From George W. Payne Co., Pawtucket, R. I.
 One 12 Spindle Cone Winder.
 From Draper Company, Hopedale, Mass.
 One Weeks Banding Machine.
 One Moscrop Single Thread Testing Machine.
 Miscellaneous Machines.
 One Yarn Inspection Machine with blackboards.
 Two Barbour Knotters.
 Two Yarn Reels and Grain Scales.
 One Power Yarn Tester.
 One Twist Counter.
 From Howard Brothers, Worcester, Mass.
 One Exhibition Board of Hand Cards.
 One Exhibition Board of Card Clothing.

Knitting Department

One Mayo "Acme" Full Automatic Seamless Knitting Machine from Mayo Knitting Machine and Needle Co., Franklin Falls, N. H.
 One Mayo "Acme" Full Automatic Knitting Machine with lace front attachment from Mayo Knitting Machine and Needle Company, Franklin, N. H.
 One Geo. D. Mayo Full Automatic Seamless Knitting Machine from Geo. D. Mayo Machine Co., Laconia, N. H.
 One George D. Mayo Full Automatic Knitting Machine with yarn changer and striper from Geo. D. Mayo Machine Co., Laconia, N. H.
 One Brinton Full Automatic Seamless Knitting Machine from H. Brinton Company, Philadelphia, Pa.
 One Brinton 200 Needle Ribber with clearing course attachment from H. Brinton Company, Philadelphia, Pa.
 One Brinton Rib Knitting Machine with Knee and Ankle Splicer and Plater from H. Brinton Co., Philadelphia, Pa.
 One McMichael and Wildman Rib Top Knitting Machine from Wildman Mfg. Company, Norristown, Pa.
 One Wildman Rib Knitting Machine, with Knee and Ankle Splicer and Automatic Stop Motion, Wildman Mfg. Co., Norristown, Pa.
 One Wildman Rib Top Machine with Automatic Stop Motion from Wildman Mfg. Company, Norristown, Pa.
 One Branson Stocking Machine from Branson Knitting Machine Co., Philadelphia, Pa.
 One Banner Knitting Machine with splicing and plating attachments from the Hemphill Mfg. Co., Pawtucket, R. I.
 One Scott & Williams New Automatic Half Hose from Scott & Williams, Philadelphia, Pa.



DESIGN LECTURE ROOM

- One Scott & Williams Ribbed Underwear Machine.
- One Crane 19 in. cylinder Flat Web Machine from Crane Mfg. Co., Lakeport, N. H.
- One Grosser, One Section Jacquard Machine from Grosser Knitting Machine Company, N. Y.
- One Grosser two thread looper for fine work from Grosser Knitting Machine Company, New York.
- One Lamb Sweater Machine from Lamb Knitting Machine Company, Chicopee Falls, Mass.
- One Lamb Glove Machine from Lamb Knitting Machine Company, Chicopee Falls, Mass.
- One 24 inch Lamb Sweater Machine from Lamb Knitting Machine Company, Chicopee Falls, Mass.
- One Beattie Looper from Beattie Machine Works, Cohoes, N. Y.
- One Hepworth Looper with Trimming Attachment from J. W. Hepworth and Co., Philadelphia, Pa.
- Five Sewing Machines, including two Shell Stitch Machines and three 2 and 3-thread Overseaming and Crocheting Machines, from Merrow Machine Co., Hartford, Conn.
- Five Sewing Machines, including machines for Overseaming, Double Stitch Covering, Seaming and Welting, Vest Finishing, etc., from Union Special Sewing Machine Co., Boston Mass.

WOOLEN AND WORSTED DEPARTMENT

Wool Sorting and Grading

This department is thoroughly equipped with benches, baskets, etc., for sorting wool in a convenient manner, and in addition there are samples of all grades and types of wool and other fibres.

Scouring and Carbonizing

Wool Scouring Machinery, C. G. Sargent's Sons Corp., Graniteville, Mass., consisting of

Cone Duster for Grease Wool.

Two Scouring Bowls, each 17 ft. x 24 in., with Parallel Rakes.

One Automatic Feeder for Scouring Bowls.

One Automatic Feeder for Dryer.

One Single Apron Dryer.

Carbonizing Screw Acid Tank.

Carbonizing Duster, with Crush Rolls.

From North Chelmsford Machine Co.

One Rinse Box.

From Schaum & Uhlinger.

One Hydro Extractor.

From C. S. Dodge, Lowell, Mass.

One Shoddy Picker.

One Bagging Stand.



DECORATIVE ART

Woolen

Picking

- One Parkurst Burr Picker, Atlas Mfg. Co., Newark, N. J.
- One Mixing Picker, Davis & Furber Machine Co., North Andover, Mass., equipped with Improved Mixing Picker Feed, and Spencer Oiler, both made by George S. Harwood & Son, Boston, Mass.

Carding

One set of Woolen Cards, including:

First Breaker, Second Breaker and Finisher, Davis & Furber Machine Co., North Andover, Mass.; this set of cards equipped with Bramwell First Breaker Feed, George S. Harwood & Son., Boston, Mass.; Torrance Balling Head and Creel, (Torrance Mfg. Co., Harrison, N. J.) between First Breaker and Second Breaker; Apperly Feed, (George S. Harwood & Son, Boston, Mass.) between Second Breaker and Finisher, and Combination Rub Rolls and Apron Condenser, (Davis & Furber Machine Co., North Andover, Mass.), on Finisher. These cards are for medium or coarse work.

One set of Davis & Furber Woolen Cards, including:

First Breaker, Second Breaker and Finisher. This set of cards equipped with Bramwell First Breaker Feed, (George S. Harwood & Son, Boston, Mass.); Apperly Feed with Kemp Traveller, (George S. Harwood & Son, Boston, Mass.), between First Breaker and Second Breaker; Bates Feed, (E. V. Bates, Lowell, Mass.), between second Breaker and Finisher, and Davis & Furber Double Apron Condenser, on Finisher. These cards are for fine work.

Both sets of cards are equipped with Chapman Electric Neutralizer, made by Chapman Electric Neutralizer Co., Portland, Me.

One Sample Mixing Card, Torrance Mfg. Co., Harrison, N. J.

Spinning

One Spinning Mule, 120 spindles, Davis & Furber Machine Co., North Andover, Mass.; Bobbin Holders, supplied by American Bobbin Holder Co., W. Medway, Mass.

One Spinning Mule, 120 spindles, Johnson & Bassett, Worcester, Mass.; Bobbin Holders supplied by Murdock & Geb, Franklin, Mass.

One 1907 Fancy Yarn Twister, 20 spindles, Davis & Furber Machine Co., North Andover, Mass.

Card Grinding

One Roy Grinding Frame, B. S. Roy & Son, Worcester, Mass.

Two Roy Traverse Grinders, B. S. Roy & Son, Worcester, Mass.

One Entwistle Traverse Grinder, T. C. Entwistle Co., Lowell, Mass.

One Complete set of Carders' Tools, W. H. Brown, Worcester, Mass.



HAND LOOMS

Worsted

Carding

One 50-inch Double-cylinder Worsted Card (4 lickerin), Davis & Furber Machine Co., North Andover, Mass., equipped with Bramwell Feed, George S. Harwood & Son, Boston, Mass. Also equipped with a Chapman Electric Neutralizer, Chapman Electric Neutralizer Co., Portland, Me.

Backwashing

One Double Bowl, Five Cylinder Backwasher, with Gill Box, Taylor-Wadworth & Co., Leeds, Eng., equipped with blueing motion, oiling motion, and Layland Patent pressure motion.

Gilling

One Doubling Balling Head Gill Box (with double screws), Lowell Machine Shop, Lowell, Mass.

One Weigh Gill Box and Creel, Lowell Machine Shop, Lowell, Mass.

Combing

One Baller, (punch), Crompton & Knowles, Worcester, Mass.

One Noble Worsted Comb, Crompton & Knowles, Worcester, Mass.

Gilling

One Finishing Can Gill Box, Hall & Stell, Keighley, England.

One Finishing Balling Head Gill Box, Hall & Stell, Keighley, England.

Bradford System of Drawing, Spinning and Twisting

The following Drawing, Spinning and Twisting Machinery, from Prince Smith & Son, Keighley, England.

One Revolving Creel for 12 Balls. One Double Head Can Gill Box.

One 2 Spindle Drawing Box. One 12 Spindle Flyer Spinner.

One 2 Spindle Weigh Box. One 12 Spindle Ring Spinner.

One 4 Spindle First Finisher. One 12 Spindle 2 Fold Cap Twister.

One 12 Spindle Dandy Reducer. One 12 Spindle 6 Fold Ring Twister.

One 12 Spindle Cap Spinner.

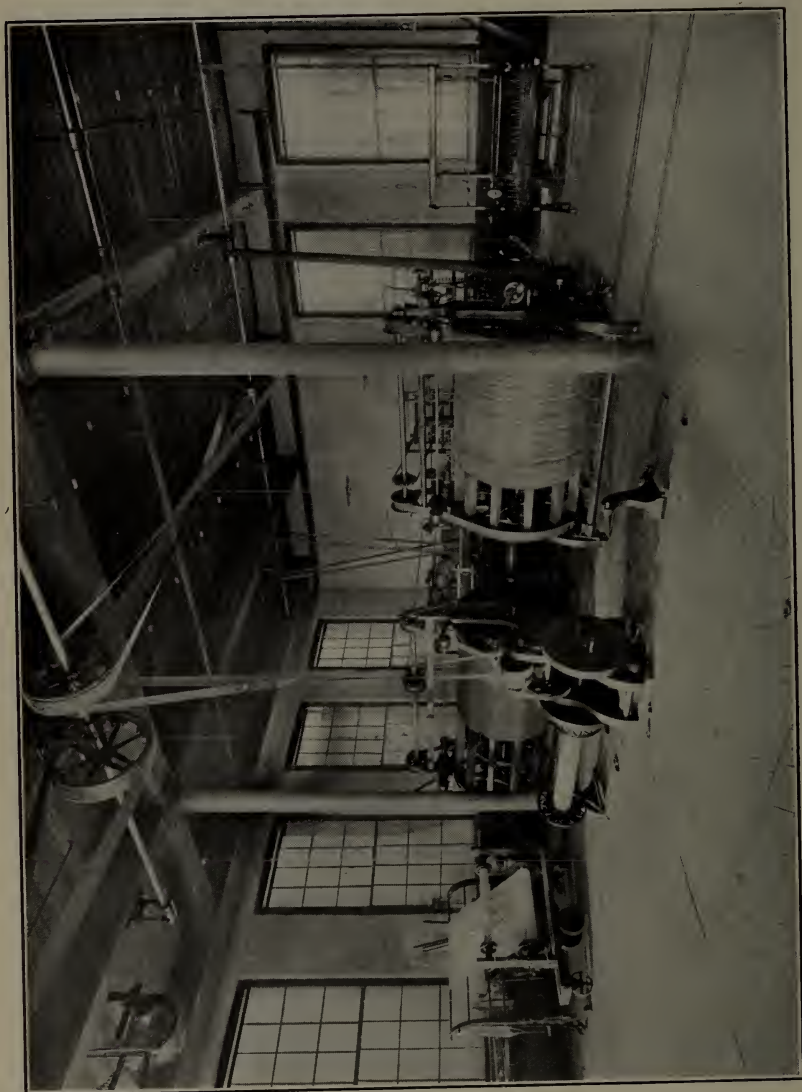
The following Drawing, Spinning and Twisting Machinery from the Lowell Machine Shop, Lowell, Mass.:

One 2 Spindle Drawing Box. One 8 Spindle Cone Rover.

One 6 Spindle Second Finisher. One 48 Spindle Cap Spinner, 4 ft. end.

One 24 Spindle Dandy Rover. One 48 Spindle Cap Spinner, 5 ft. end.

One 6 Spindle Cone Reducer. One 48 Spindle Boyd Ring Twister.



WARP PREPARATION

One Six Gang Universal Winder, equipped for cones or straight tubes,
Universal Winding Co., Boston, Mass.

One Tape Band Sewing Machine, The Singer Mfg. Co., New York.

French System of Drawing and Spinning

The machinery made by the "Societe Alsacienne de Constructions
Mechaniques" at Mulhouse, France, consists of the following:

FRENCH NAMES	ENGLISH NAMES
Gill Box (2 têtes)	Gill Box (2 heads)
Étirage à Frottoirs (2 têtes)	1st Drawing (2 heads)
Étirage à Frottoirs (2 têtes)	2nd Drawing (2 heads)
Étirage à Frottoirs (2 têtes)	3rd Drawing (2 heads)
Étirage Réunion (4 Peignes)	Reducer (4 Porcupines)
Bobinier de Chûte (8 Peignes)	Slubber (8 Porcupines)
Bobinier (8 Peignes)	1st Intermediate (8 Porcupines)
Bobinier (8 Peignes)	2nd Intermediate (8 Porcupines)
Bobinier (8 Peignes)	Rover (8 Porcupines)
Finisseur (16 Peignes)	Finisher (16 Porcupines)
Selfacting à Filer (150 Broches)	Selfacting Mule (150 Spindles)

The apparatus in this department for obtaining and preserving the
requisite condition of humidity consists of:

Four Humidifiers of the American Moistening Co., Boston, Mass.

Nine Thompson Turbo Humidifier Heads from The G. M. Parks
Co., Fitchburg, Mass.

Yarn Weighing and Testing

From Lowell Scale Company:

One Large Platform Scale.

From Howe Scale Company

One Dram Scale.

One Gramme Scale.

One Ounce Scale.

One Pound and Ounce Scale.

Two Yarn Reels.

One Roving Reel.

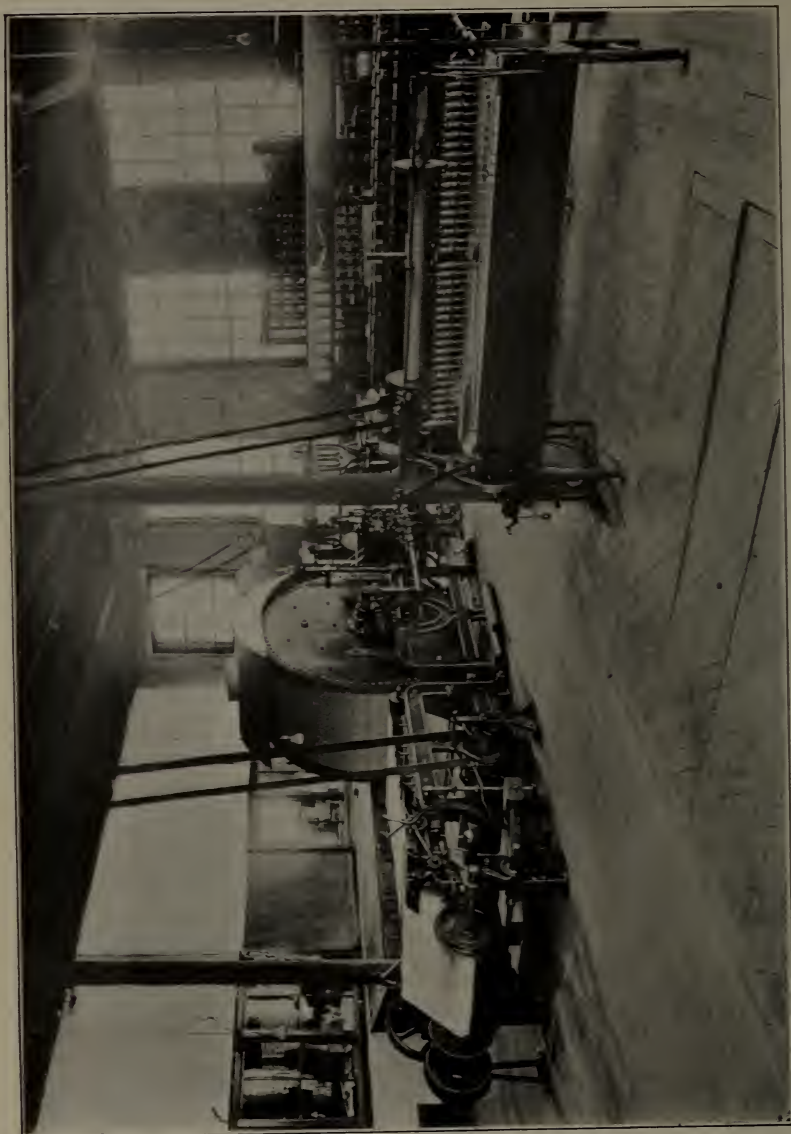
Three Grain Scales.

One Run Beam.

One Hand Yarn Strength Tester.

Two Twist Counters.

Two Barbour Knotters.



WARP PREPARATION

DESIGN AND POWER WEAVING DEPARTMENT

Cotton Warp Preparation

- One Spooler, Lowell Machine Shop, Lowell, Mass.
- One Warper, Lowell Machine Shop, Lowell, Mass.
- One Slasher, Lowell Machine Shop, Lowell, Mass.
- One Beamer, T. C. Entwistle Co., Lowell, Mass.
- One Winder, Altemus & Co., Philadelphia, Pa.
- One 400 End Improved Draper Warper, Draper Co., Hopedale, Mass.
- Drawing-in Frames, etc.
- One Pat. Slasher Press Roll, J. Battles & Co., Lawrence, Mass.
- One Pat. Expansion Comb for Warper, T. C. Entwistle Co., Lowell, Mass.
- One Quiller, Johnson & Bassett, Worcester, Mass.
- Set of six in. spools for Warper, Macrodi Fibre Co., Woonsocket, R. I.
- One Universal Winder for Cop and Bobbin winding, Universal Winder Co., Boston, Mass.

Woolen and Worsted Warp Preparation

- Two 40 End Jack Spoolers.
- Two Spool Racks for 12 spools each.
- One Pattern Dry Frame Dresser.
- One Pipe and Cylinder Dresser.
- One 60 inch Reel.
- One 82 inch Reel.
- One Double Head Beamer.
- All made by the Davis & Furber Machine Co., North Andover, Mass.

Braiding Machinery

- One 24 Line Hercules Braider.
- One 12 Line Braider.
- One Tubular Braider.
- One Sautach Braider.
- All made by the New England Butt Co., Providence, R. I.

Silk Preparing Machinery

- One Winder, Atwood Machine Co., Stonington, Conn.
- One Ribbon Quiller, Atwood Machine Co., Stonington, Conn.
- One Warper and Beamer, Swiss Style, Atwood Machine Co., Stonington, Conn.
- One Double Frame, Atwood Machine Co., Stonington, Conn.



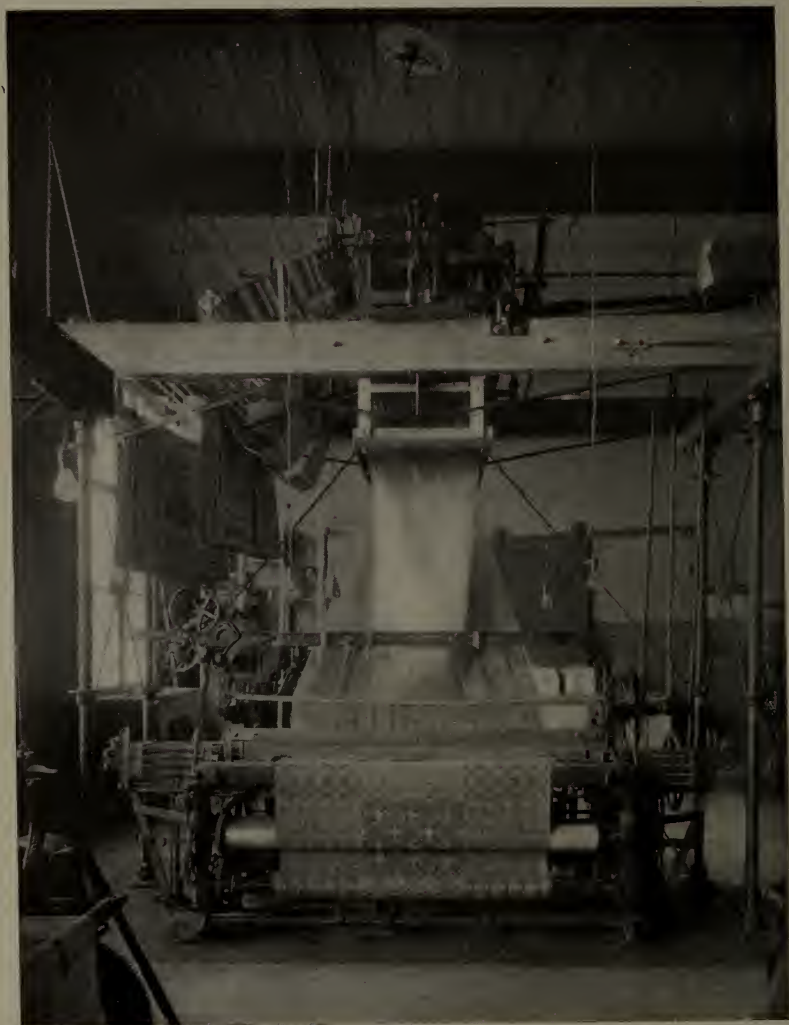
POWER WEAVING

Plain Looms

- One Plain Northrop Loom, Draper Co., Hopedale, Mass.
- One Plain Print Cloth Loom, Whitin Machine Works, Whitinville, Mass. To this is attached a Kip-Armstrong Warp Electric Stop Motion.
- One Plain Print Cloth Loom, Mason Machine Works, Taunton, Mass.
- One Kilburn & Lincoln Plain Loom.
- Eight Lowell Machine Shop Plain Looms.
- One English Loom, Hattersley.
- One Improved Northrop Loom, fine sateen, Draper Company, Hopedale, Mass.
- One Northrop Loom with dobby, Draper Co., Hopedale, Mass.
- One Side Cam Twill Loom, Whitin Machine Works, Whitinsville, Mass.
- One Five Harness Sateen Loom, Lowell Machine Shop, Lowell, Mass.
- One Harriman Automatic Shuttle Changing Loom.
- One Lewiston Machine Co. Loom, 4 harness, side cam.
- One Crompton Jean Loom.

Fancy Looms

- One Lewiston Machine Company Bag Loom.
- One Knowles Gingham Loom, 4 boxes, Crompton-Knowles Loom Works.
- One Crompton Gingham Loom, 4 x 1 boxes, Crompton-Knowles Loom Works.
- One Crompton Towel Loom, 2 x 1 boxes, Crompton-Knowles Loom Works.
- One Crompton Lappet Loom, with 16 harness dobby, Crompton-Knowles Loom Works.
- One Knowles Fancy Cotton Loom, 20 harness dobby, 4 boxes, for fancy leno work, Crompton-Knowles Loom Works.
- One Knowles Fancy Cotton Loom, 25 harness dabby, Crompton-Knowles Loom Works.
- One Crompton Fancy Cotton Loom, single cylinder, 20 harness dobby, Crompton-Knowles Loom Works.
- One Knowles Gem Loom, 20 harness, 4 x 4 boxes, Crompton-Knowles Loom Works.
- One Crompton Worsted Loom, 24 harness, 4 x 4 boxes, Crompton-Knowles Loom Works.
- One Crompton Fancy Loom, 6 x 1 double cylinder, 20 harness dobby, Crompton-Knowles Loom Works.
- One Twenty Harness Dobby Loom, Whitin Machine Works, Whitinsville, Mass.
- One Crompton & Knowles Heavy Loom, 20 harness, 4 x 4 boxes, Crompton-Knowles Loom Works.



A TAPESTRY LOOM

- One Knowles Blanket Loom, 25 harness dobby, 4 boxes, Crompton-Knowles Loom Works.
- One Knowles Worsted Loom, 32 harness, 4 x 4 boxes, Crompton-Knowles Loom Works.
- Three Knowles Heavy Woolen Looms, 25 harness, 4 x 4 boxes, Crompton-Knowles Loom Works.
- Three Crompton & Knowles Intermediate Looms, 25 harness, 4 x 4 boxes, Crompton-Knowles Loom Works.
- One Model Dobby Attachment.

Jacquard Looms

- One Knowles Fancy Loom, single lift Jacquard, Crompton-Knowles Loom Works.
- One Knowles Fancy Loom, double lift Jacquard, Crompton-Knowles Loom Works.
- One Knowles Fancy Loom, Jacquard tied up for leno, Crompton-Knowles Loom Works.
- One Knowles Ingrain Carpet Loom, 4 x 4 boxes, Crompton-Knowles Loom Works.
- One Crompton Ingrain Carpet Loom, 4 x 4 boxes, Crompton-Knowles Loom Works.
- One Stafford Silk Loom, 1200 hook Halton Jacquard.
- One Crompton & Knowles 72 in. Tapestry Loom with 2600 hook Halton Jacquard Head.
- One 400 hook single lift, Schaum & Uhlinger Jacquard mounted for 4 bank narrow fabric loom.
- One 840 hook double lift, single cylinder Jacquard on Crompton-Knowles 4 bank ribbon loom.
- One 800 hook double lift Knowles Gem Silk Brocade Jacquard Machine, 4 x 4 boxes, Crompton-Knowles Loom Works.
- One Felix Tonnar German Plush Loom

Card Cutting Machines

- One Jacquard Fine Index Card Cutting Machine, John Royle & Sons, Paterson, N. J.
- One Jacquard French Index Card Cutting Machine, John Royle & Sons, Paterson, N. J.

Hand Loom Weaving

- Twelve Hand Looms, 3 x 3 boxes, 20 harness dobby.
- Eight Hand Looms, 4 x 4 boxes, 24 harness dobby.
- Eight Hand Looms, 3 x 3 boxes, 32 harness dobby.
- Six Hand Looms, 4 x 4 boxes, 30 harness dobby.



JACQUARD SECTION

POWER WEAVING

Two Hand Looms, 4 x 4 boxes, 32 harness dobby.
Two Hand Looms, 4 x 4 boxes, 200 hook Jacquard.
Two Hand Looms, 3 x 3 boxes, 200 hook Jacquard.
Two Hand Looms, 3 x 3 boxes, 600 hook Jacquard.
One Hand Loom, 48 harness.
Two Hand Looms with treadles.
Pattern Warping Stands.
Beaming, drawing-in stands, etc.

CHEMISTRY AND DYEING DEPARTMENT

Chemical Laboratories

The General Chemistry and Qualitative Analysis Laboratory includes:

One hundred and twenty laboratory desks, each containing a full set of apparatus for the first year's work in Chemistry; also gas and water fittings, reagents and sinks.

Four Large Double Hoods.

Two Steam Baths.

Two Parson's Automatic Gas Generators.

Quantitative Laboratory

One Water Distilling Apparatus.

One Steam Drying Closet and Several Drying Ovens.

One Large Steam Bath.

One Electrolytic Table.

Five Hoods.

Fifty laboratory desks, each fully provided with apparatus.

Balance Room

One Large Christian Becker Analytical Balance.

Seven Small Christian Becker Analytical Balances.

One Standing Analytical Balance.

One Eimer & Amend Analytical Balance.

One H. L. Becker's Son & Co. Analytical Balance.

Combustion Room

One Combustion Furnace, 25 burners.

One Lothar Meyer's Furnace for tubes.

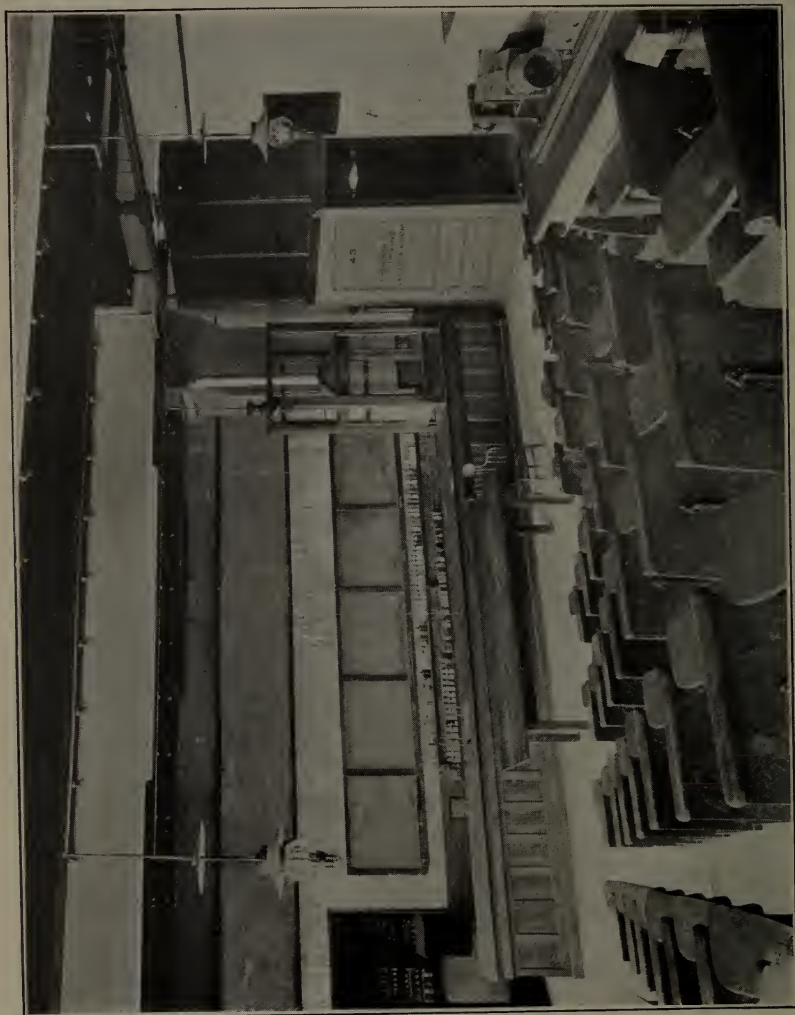
One Kerosene Burner Muffle Furnace.

Microscopic and Colorimetric Laboratory

Two Benches for microscopical work.

Three Bausch & Lomb Compound Microscopes.

One Nachet et Fils Compound Microscope.



CHEMISTRY LECTURE ROOM

One Tintometer.
One Ives Colorimeter.
Desks and shelves for the apparatus and reagents necessary for this branch of the work.
Adjoining this Laboratory is a dark room for Spectrum Analysis, Photometric Work, etc.

Assistant Instructor's Laboratory

One Large Case of chemicals.
One Double Hood.
One Copper Water Bath.
One Soapstone Sink with a drain board.
Benches, desks and complete fittings for water, gas and suction.

Private Laboratory

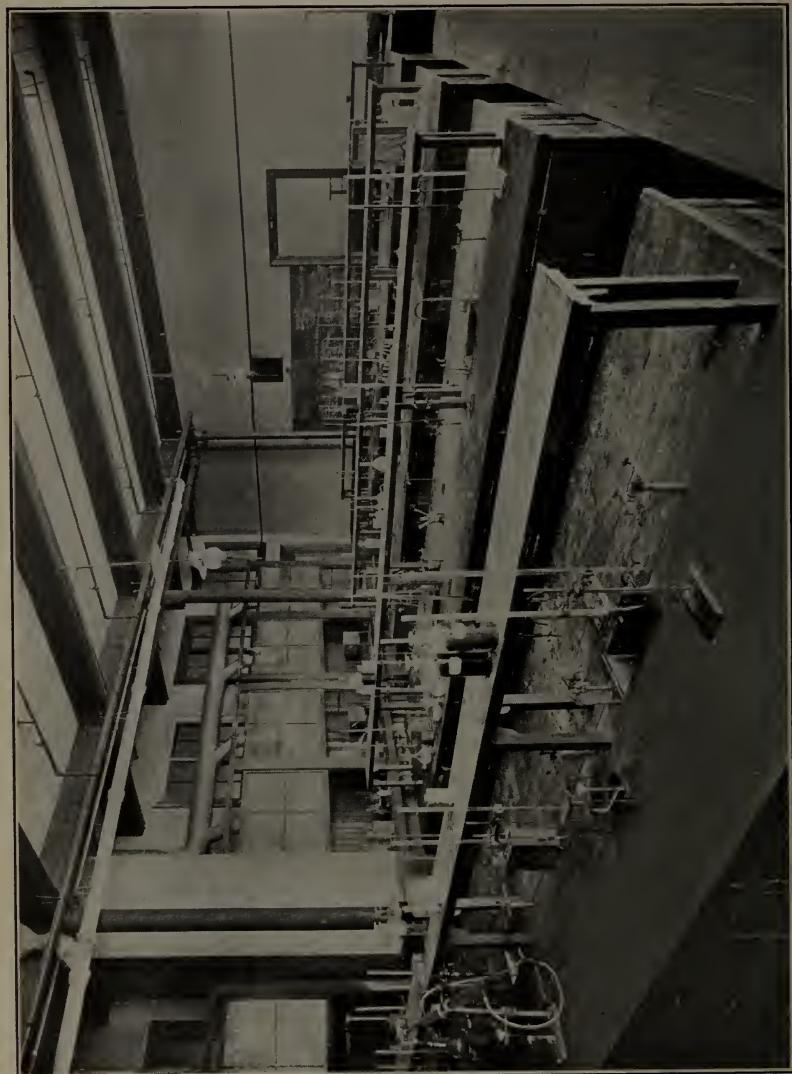
One Groemner Balance.
One Large B. & L. Microscope.
One Parr Calorimeter.
One Case for Chemicals and Apparatus.
Three Laboratory Benches, with necessary fittings.
One Large Hood.
One Steam Bath.
One Experimental Dye Apparatus.
One Porcelain Sink and Drain Board.

Chemical Lecture Room

Is provided with a lecture table fully equipped with gas, water, sinks, a hood and sufficient apparatus for lecture experiments.
An electric arc reflectroscope provided with suitable screen, which makes it possible to illustrate a lecture either from slides or by cuts, photographs or objects.
Seats are provided for 80 students, and are arranged on a raised floor so that every student has a full view of the lecture table.
This room contains various collections of dye stuffs and chemicals for exhibition and for lecture demonstration.

Experimental Dyeing Laboratory

The dyeing laboratory is equipped with individual benches, small dyeing apparatus, reels, balances, apparatus for dye testing, such as frames for exposing dyed material to light, and a complete collection of dyestuff samples and sample cards.



QUANTITATIVE LABORATORY

One Small Hydro-Extractor, from W. H. Tolhurst & Son, Troy, N. Y.
Twenty-four Steam Jacketed Experimental Dyeing Machines.
Thirty Steam Coil Experimental Dyeing Machines.
One Drying Chamber.
One Ageing Chamber.

Experimental Printing Laboratory

One Calico Printing Machine, made by Mather & Platt, Oldham, England.
One Iron Jacketed Steaming Chamber from A. Edmeston & Son, Salford, England.
One set of Steam Jacketed Copper Kettles.

Fuel and Oil Analysis Laboratory

Mahler Bomb Calorimeter, with complete outfit.
Emerson Bomb Calorimeter, with complete outfit.
Parr Calorimeter.
Abbe Refractometer.
Torsion Viscosimeter.
Tagliabue Viscosimeter.
Tagliabue Cold Test Apparatus.
Pensky Martin Oil Tester.
N. Y. State Oil Tester.
Sartorius Specific Gravity Balance.
Two Becker Analytical Balances.
Gas Muffle Furnace.
Kny Scherer Oil Tester.
Graefe Gas Calorimeter.
Orsat Gas Analysis Apparatus.
Laboratory Tables, Lockers and Hoods.

Industrial Chemistry Laboratory

One Filter Press, Type E, T. Shriver and Co.
One Single Acting Triplex Plunger Pump, Gould's Mfg. Co.
One Vacuum Drying Apparatus, Norman Hubbard's Sons.
One Surface Condenser, Norman Hubbard's Sons.
One Packard Vacuum Pump, Norman Hubbard's Sons.
One Vacuum Evaporator, Swenson System, American Foundry and Machine Co.
One Centrifugal, C. H. Chavant and Co.
One Double Jar Mill, F. I. Stokes and Co.
One Sturtevant Ore Crusher.
One Sturtevant Pulverizer.
Ten Copper Steam Baths, D. H. Wilson and Co.



BALANCE ROOM

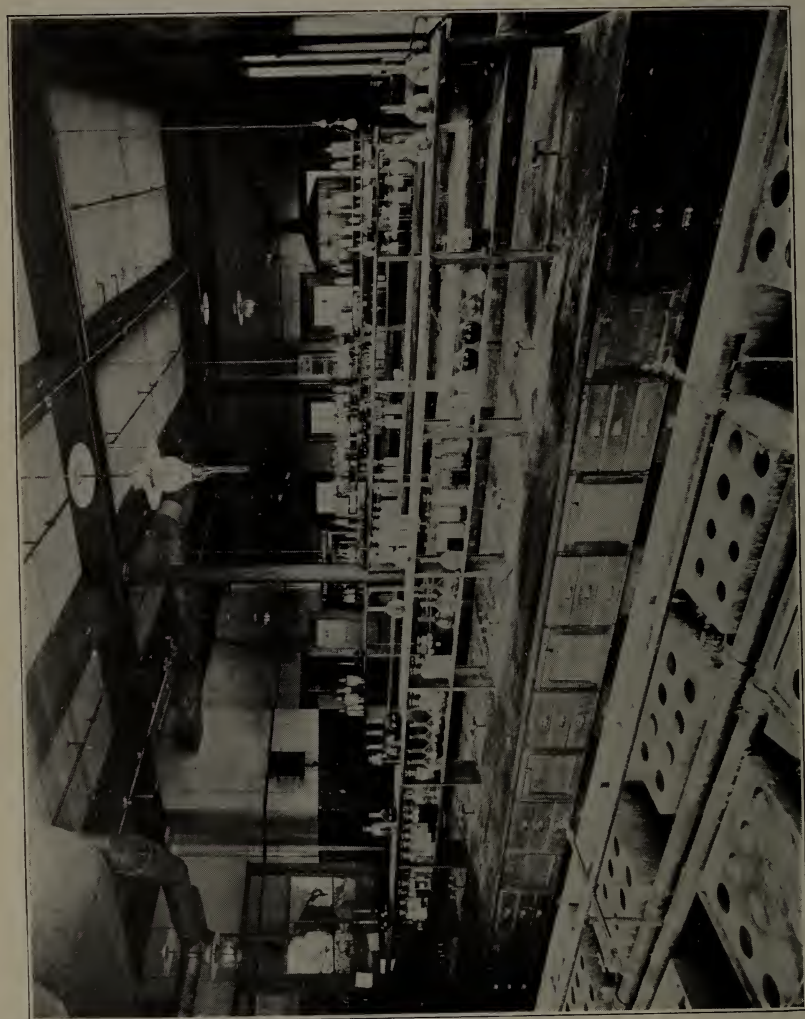
One 36 in. Ventilating Fan, Mass. Fan Co.
One Autoclave.
Twenty-four Lockers.
Two Concrete Top Tables.

Commercial Dyeing Laboratory

One Kier, Atlantic Works, East Boston, Mass.
One small Kier, fitted with E. D. Jefferson's circulating device.
One Electrolyzer for manufacturing bleaching solutions, The National Laundry Machinery Co., Dayton, Ohio.
One 4 String Dyeing Machine, Rodney Hunt Machine Co., Orange, Mass.
One Mercerizing Machine.
One Raw Stock Dyeing Machine, Klauder-Weldon Dyeing Machine Co., Amsterdam, N. Y.
One Yarn Dyeing Machine, Klauder-Weldon Dyeing Machine Co., Amsterdam, N. Y.
One Jig Dyeing Machine, The Textile-Finishing Machinery Co., Providence, R. I.
One set of Drying Cans, The Textile-Finishing Machinery Co., Providence, R. I.
One Chain Dyeing Machine, T. C. Entwistle Co., Lowell, Mass.
One Raw Stock Drying Table, Philadelphia Textile Machinery Co., Philadelphia, Pa.
One Padding Machine, Arlington Machine Works, Arlington, Mass.
One Hydro-Extractor, W. H. Tolhurst & Son, Troy, N. Y.
One Experimental Dyeing Machine, The Psarski Dyeing Machine Company, Cleveland, Ohio.
Seven Dye Tubs.
One Power Yarn Reel.
One Reeves' Variable Speed Device.
Two Trucks.

FINISHING DEPARTMENT

One 2 string Washer, Rodney Hunt Co., Orange, Mass.
One Fulling Mill, Rodney Hunt Co., Orange, Mass.
One Sample Fulling Mill, James Hunter & Co., North Adams, Mass.
One Up and Down Dry Gig, Curtis & Marble, Worcester Mass.
One Rolling and Stretching Machine, Curtis & Marble, Worcester, Mass.
One Up and Down Wet Gig, Curtis & Marble, Worcester, Mass.
One Steam Finishing Machine, Curtis & Marble, Worcester, Mass.
One 60 in. 3 burner Singeing Machine, adapted for Cotton, Silk or Worsted goods, Curtis & Marble, Worcester, Mass.



EXPERIMENTAL DYEING LABORATORY

- One Two Cylinder Double Acting Brushing Machine, Curtis & Marble, Worcester, Mass.
- One 60 in., 4 Cylinder Sanding and Polishing Machine, Curtis & Marble, Worcester, Mass.
- One Kicker Mill, James Hunter & Co., North Adams, Mass.
- One 6-4 Double Shear, Parks & Woolson, Springfield, Vt.
- One Single Shear, Curtis & Marble. Donated by Mass. Mohair Plush Co., Lowell, Mass.
- One Dewing Machine, G. W. Voelker & Co., Woonsocket, R. I.
- One 6-4 Voelker Rotary Press, G. W. Voelker & Co., Woonsocket, R. I.
- One Tentering and Drying Machine, John Heathcote, Providence, R. I.
- One Single Crabbing Machine, H. W. Butterworth & Son, Philadelphia, Pa.
- One 72 in., Woolen Napper, Davis & Furber, North Andover, Mass.
- One 32 in. Basket Hydro-Extractor, W. H. Tolhurst, Troy, N. Y.
- One A. W. C. Measuring and Weighing Machine, Parks & Woolson, Springfield, Vt.
- One Lintz & Eckhardt Cloth Numbering Machine, improved by Durbrow & Hearne Mfg. Co., New York.
- One Steam Press for Underwear, United States Hoffman Co., Syracuse, N. Y.
- One Sewing Machine, Birch Brothers, Somerville, Mass.
- Soap tanks, perch, burling and measuring tables.

ENGINEERING DEPARTMENT

PHYSICAL LABORATORY

Through the generosity of a friend of the School a laboratory has been provided with the most approved apparatus for testing the physical properties of all fibres, yarns and fabrics; the equipment includes:

- One Bausch and Lomb D. D. Microscope.
- Two inch, 1 inch, and 1-2 inch regular eyepieces.
- Three-fourths inch (photographic), 2-3 inch, 1-6 inch, 1-12 inch (oil immersion) objectives.
- One Eye Piece Micrometer.
- One Filar Micrometer, (1 inch equivalent eyepiece) for refined diameter determinations.
- One Standard Glass Stage, divided to 1-10 and 1-100 m. m. with corrections as tested against the International m. m.
- Complete outfit for mounting shades.
- Complete outfit for photo micrography.
- Camera Lucida.
- Microtome Sectioning Outfit.



EXPERIMENTAL PRINTING LABORATORY

One Small Skein Testing Machine.

One set Conditional Ovens for moisture determination.

One Yarn Testing Machine, adjusted to test strength, twist, take up, elasticity, and stretch.

One Hydraulic Cloth Strength Testing Machine.

One Brown & Sharpe Metre Reel.

Miscellaneous apparatus for experiments in Mechanics, Heat, Light, Sound and Electricity.

The proper conditions of humidity in this laboratory are obtained and maintained by one Thompson Air Turbo Humidifier Head, made and installed by The G. M. Parks Mfg. Co., Fitchburg, Mass., and also by one Humidifier Head made by Schutte & Koerting Co., Philadelphia, Pa.

ENGINEERING LABORATORY

The engineering laboratory contains the following equipment:

50 H. P. Allis-Chalmers Corliss steam engine (Reliance type) for experimental purposes arranged to operate condensing or non-condensing and direct connected to an Alden absorption dynamometer.

Wheeler Surface Condenser (200 sq. ft. surface) with 5 in. x 6 in. x 6 in. x 7 in. combined air and circulating pump.

25 K. W. Kerr steam turbine (7 stage) direct connected to 25 K. W. Richmond Electric Co. alternating current generator and arranged for both condensing and non-condensing conditions. The piping is also arranged that this turbine may be run as a low pressure turbine in conjunction with the Allis Chalmers engine. The generator is especially designed for experimental work with connections and windings for all the commercial phases.

5000 gallon pressure tank for heads up to 300 ft. and connections for experimental work.

Two 2500 gallon concrete storage tanks.

Complete set of weighing and suction tanks on Fairbanks Standard scales.

Deane Triplex power pump, 4 in. x 6 in.

Clayton air compressor (belted type) 6 in. x 6 in.

Centrifugal pump, 2 inch (belted type), Lawrence Machine Company, Lawrence, Mass.

Two Sturtevant fan blowers for experimental work.

Metropolitan injector.

Differential transmission dynamometer.

Variable speed transmission.

Accessory apparatus such as steam and gas engine indicators, planimeters, thermometers, etc. Apparatus for gas analysis is also available and the chemical department is fully equipped for calorific determinations of fuels.



INDUSTRIAL CHEMISTRY LABORATORY

All steam supplied to the laboratory passes through a 4 inch horizontal
Cochrane steam separator to insure dry steam for experimental
work.

Buff & Buff Engineers Transit.

Philadelphia level rod.

Apparatus for testing friction and slip of belts and pulleys.

Standard Westinghouse A. C. generator, switchboard panel with
special instruments and connections for 25 K. W. turbo-generator
in 2-phase, 3-phase or single phase.

Westinghouse portable polyphase A. C. wattmeter with series trans-
formers.

Two General Electric A. C. Ammeters.

One General Electric A. C. Voltmeter.

General Electric 3 H. P. induction motor.

Allis-Chalmers 10 H. P. direct current motor.

One 4 H. P. G. E. Electric Dynamometer which may be used as a
double current generator or rotary transformer receiving direct
current at 220 volts and delivering three phase alternating current
which by a step-up transformer will give 220 volts at 60 cycles.

One 250 volt Weston Portable Voltmeter.

One 250 volt Weston Portable Voltmeter with calibrating coil.

One 150 ampere Weston Portable Ammeter.

One Weston Portable Millivoltmeter with 200 milli-volt and 20 milli-
volt scales.

One 2 ampere and one 20 ampere shunt for use with above instrument
as an ammeter.

One D'Arsonval Reflecting Galvanometer.

One Simple Galvanometer.

One Wheatstone Bridge.

Two Direct Current Self Feeding Arc Lamps.

Two Hand Feed Arc Lamps for stereopticons.

Resistance boxes of various sizes and other apparatus necessary for
commercial testing of lamps, motors, etc.

An Exhibition Board containing samples of the Chloride and Exide
Storage Battery Plates donated by the Electric Storage Battery
Co. of Philadelphia.

Machine Shop

The equipment of the machine shop is as follows:

Three standard engine lathes, 13 inch swing, 6 foot bed, from Flather &
Co., Nashua, N. H.

One new model quick change engine lathe, 14 in. swing, 6 ft. bed,
from Flather & Co., Nashua, N. H.



VIEW IN COMMERCIAL DYEING LABORATORY

One standard engine lathe, 18 in. swing, 10 foot bed, with taper attachment, from Flather & Co., Nashua, N. H.

Three speed lathes, 11 in. swing, 5 foot bed, from J. G. Blount, Everett, Mass.

One 23 inch upright drill, with back gears and power feed, from J. E. Snyder & Son, Worcester, Mass.

One 14 inch single spindle sensitive drill, from the Stanley Mfg. Co., Lawrence, Mass.

One 24 in. x 24 in x 6 ft. planer, from the Mark Flather Planer Co., Nashua N. H.

One No. 1, Universal Milling Machine with all three feeds automatic, from the Kempsmith Mfg. Co., Milwaukee, Wis.

One 20 inch wet tool grinder, from J. G. Blount, Everett, Mass.

One 12 inch, two wheel, dry grinder, from J. G. Blount, Everett, Mass.

One 30 inch grindstone and frame, from the Athol Machine Company, Athol, Mass.

One single spindle centering machine, from the D. E. Whiton Machine Co., New London, Conn.

One power hack saw, from the Fairbanks Co., Boston, Mass.

These tools are fully equipped with chucks, centres, tools, etc., for a great variety of work. Benches with vises are also provided for such work as chipping, filing, etc.

A thoroughly equipped tool room contains an ample stock of the best makes of small tools such as drills, taps and dies, milling cutters, reamers, gauges, micrometers, etc.

The following wood working tools are also provided in addition to benches for pattern making:

One pattern maker's lathe, 16 in. swing, 8 foot bed, from Fay & Scott, Dexter, Maine.

One 32 in. band saw, from the Crescent Machine Co., Leetonia, O.

One iron single saw bench, from the Crescent Machine Company, Leetonia, O.

Two blacksmith forges, anvils and tools are also provided, and a gas oven for hardening and tempering tools.

POWER, LIGHT, HEAT AND VENTILATING PLANT

One 300 H. P. Aultman and Taylor Horizontal Water Tube Boiler, equipped with U. S. Rocking Grates.

Two 100 H. P. Stirling Water Tube Boilers.

These boilers are connected to a Sturtevant Induced Draft Apparatus, including fan, direct connected to the Sturtevant vertical engine and equipped with two way dampers. One of the Stirling Boilers is so piped that it may be cut off from the regular plant in order to supply the Engineering Laboratory only.

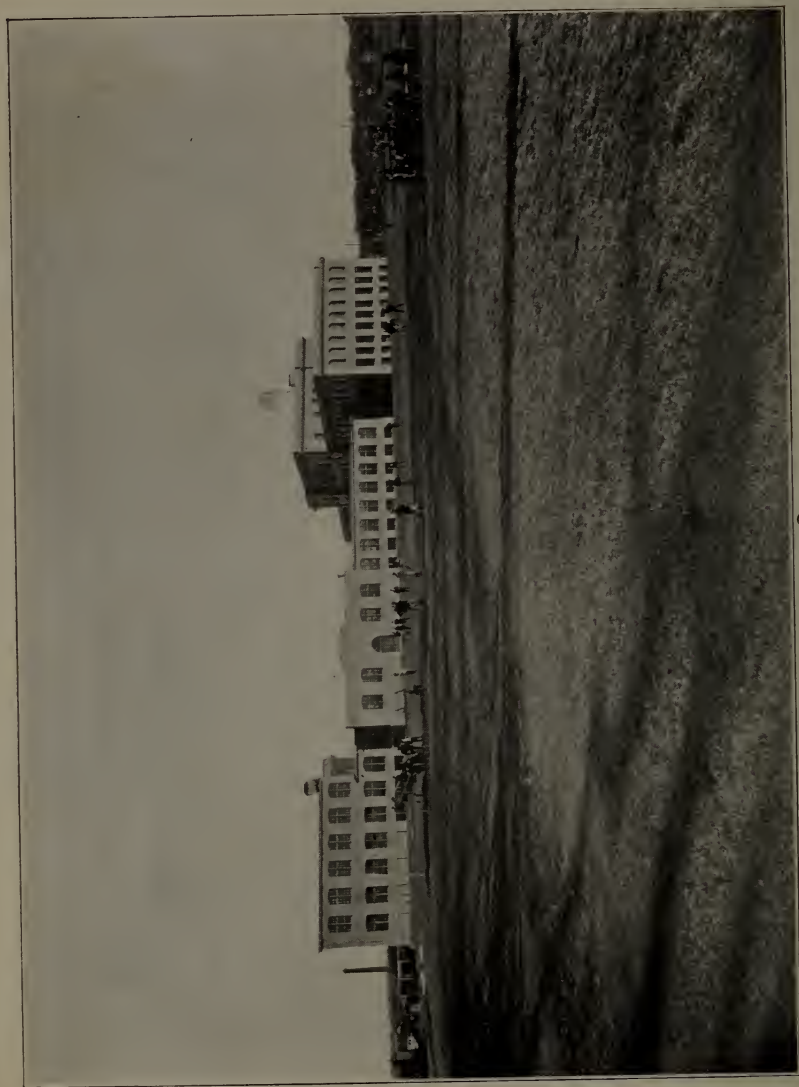


FUEL AND OIL LABORATORY

- One Sturtevant Smoke Filtering Apparatus.
- One Locke Steam Pressure Regulator for draft engine.
- One Knowles Boiler Feed Pump, 6 in. x 4 in. x 6 in.
- One Warren Webster Feed Water Heater, Filter and Oil Extractor.
- One Payne 14 in. x 14 in. Automatic High Speed Engine of 125 H. P.
- One 9 1-2 in. x 11 3-4 in. Nash Gas Engine of 50 H. P. of the four cycle type, with speed regulating clutch and hit and miss governor.
- One Motor Driven Air Compressor 5 1-2 in. x 6 in. with a storage tank of 20 cubic feet capacity, 100 lbs. per sq. in. pressure.
- One Complete Sturtevant Double Duct System for heating Southwick Hall. This apparatus is designed to provide the proper amount of fresh warm air called for by the State law as applied to educational institutions, and includes a 9 ft. x 4 ft. fan direct connected to the Sturtevant horizontal engine, drip tank and Knowles automatic return pump, 4 1-2 in. x 2 3-4 in. x 4 in. arranged to deliver either to the feed water heater or to the boilers direct.
- Complete Ventilation System for Southwick Hall and Falmouth Street Building including 6 direct connected motor driven exhaust fans.
- One Sturtevant Fan and Heater for Kitson Hall and Falmouth Street Building, direct connected to a Sturtevant inverted engine.
- One Cross Oil Filter.
- One Complete Moistening Apparatus installed by the American Moistening Co., Boston, Mass., including Knowles triplex 4 x 4 power pump, tank, and 20 moistening heads.
- One Ingersoll-Rand 8 x 8 Steam Driven Air Compressor for use with Thompson's Turbo Heads, installed in French Spinning Department, by the G. M. Parks Co., Fitchburg, Mass.
- A Complete Sprinkler System for fire protection, using the Grinnell glass button heads.
- One Bullock 75 K. W. Direct Current Multipolar Compound Generator, wound for 220 volts, over compounded 20 volts from no load to full load. This is direct connected to the Payne engine.
- One Bullock 30 K. W. Generator of the same type, direct connected to the Nash gas engine.

The switchboard is arranged so that either unit may be thrown in independently on the power or lighting feeders or the two machines may be run in parallel. The lighting circuits are on the two wire 220 volt system and supply the equivalent of 1030—16 candle power lamps. The power circuits are on the same system and supply approximately 170 H. P. in motors.

- Three 24 H. P. Bullock Motors.
- One 20 H. P. General Electric Motor.
- Two 10 H. P. Allis Chalmers Motors.
- Two 7 1-2 H. P. General Electric Motors.



ATHLETIC FIELD AND SCHOOL BUILDINGS

Four 15 H. P. Bullock Motors.
One 3 H. P. Motor, New England Motor Co.
One 2 H. P. Motor, Holtzer-Cabot Electric Co.

ATHLETICS

Through the generosity of Mr. Frederick Fanning Ayer, the school has been provided with a Campus and Athletic Field of about three acres. This has been carefully graded and laid out for base ball, foot ball and track athletics. Bleachers have been provided for the use at the out-of-door games.

In the basement of Kitson Hall there has been provided a recreation room for the use of the students at such times as their attendance is not required in classes. This room is also used by those who take part in athletics, and connected to it is a smaller room provided with shower baths, lockers and toilets. Both rooms are easily accessible to the Campus by way of the outer door of Kitson Hall.

The upper hall of Southwick Hall has been equipped with gymnastic apparatus. Chest weights, wooden dumb bells, Indian clubs, a set of travelling rings, a vaulting horse, parallel bars, a punching bag and several sets of foils and single sticks have been provided.

This year the services of a physical director have been engaged and regular classes for first year students have been held in gymnasium work.

In order to assure that no student having any dangerous physical weakness should take part in any athletic contest, all candidates for the various athletic teams are obliged to pass a satisfactory physical examination given by the Medical Adviser of the school. All students of this class must undergo a physical examination at the opening of the school year and again at the end of the physical training course in the spring. Records are kept and a comparison is made that progress during the year may be noted.



LECTURE ROOM — ENGINEERING DEPARTMENT

DAY CLASSES

Entrance Qualifications

Candidates for admission are accepted upon presentation of properly vouched certificates showing the completion of a regular four year course in High School or Academy of reputable standing. The certificate must specify that the applicant has satisfactorily passed the subjects hereafter listed for entrance examinations. For all others, there are held examinations, as stated in calendar; candidates failing to pass at June examinations are allowed to try again in September; those who cannot attend the June examinations, may present themselves in September.

The Calendar of examinations is as follows:

Monday, June 19, 1911; September 11, 1911; and Tuesday, June 18, 1912:

Algebra	9 to 11 A. M.
History	11 A. M. to 1 P. M.
English	2 to 4 P. M.

Tuesday, June 20, 1911; September 12, 1911; and Wednesday, June 19, 1912:

Geometry	9 to 11 A. M.
Modern Languages (French or German)	11 A. M. to 1 P. M.
Arithmetic	2 to 4 P. M.

Algebra

Fundamental operations, parenthesis; factoring; highest common factor; least common multiple; fractions, simple and complex; simple equations, one or more unknown quantities; radicals; involution and evolution; square and cube root; logarithms; ratio and proportion; exponents, including fractional and negative.

For June, 1912 and thereafter the applicant will be held responsible for the additional subjects of Quadratic Equations, Arithmetical and Geometrical Progression and the Binomial Theorem.

Plane Geometry

As much plane geometry as is included in any of the generally accepted text books. The student should be familiar with properties of plane rectilinear figures, the measurement of angles, the circle, polygons, etc. He should be able to make applications to the measurement of lines and plane figures.



MECHANICAL DRAWING ROOM

Solid Geometry

Wherever possible the applicant should pursue a course in Solid Geometry equivalent to that covered by the recognized text books used in Preparatory and High Schools. It is desirable that students should be able to describe the solid geometric forms and to calculate the volume and surfaces of the more common solids.

A knowledge of this subject is of assistance in the work of the school and although it is not a requirement for entrance at present, it will undoubtedly be added at no distant date.

Arithmetic

The preparation in this subject should be pursued for two objects:—familiarity in the fundamental principles and accuracy in solution. Special attention should be given to problems in percentage, interest, discount, square and cube root, alligation, ratio and proportion, Metric System.

English

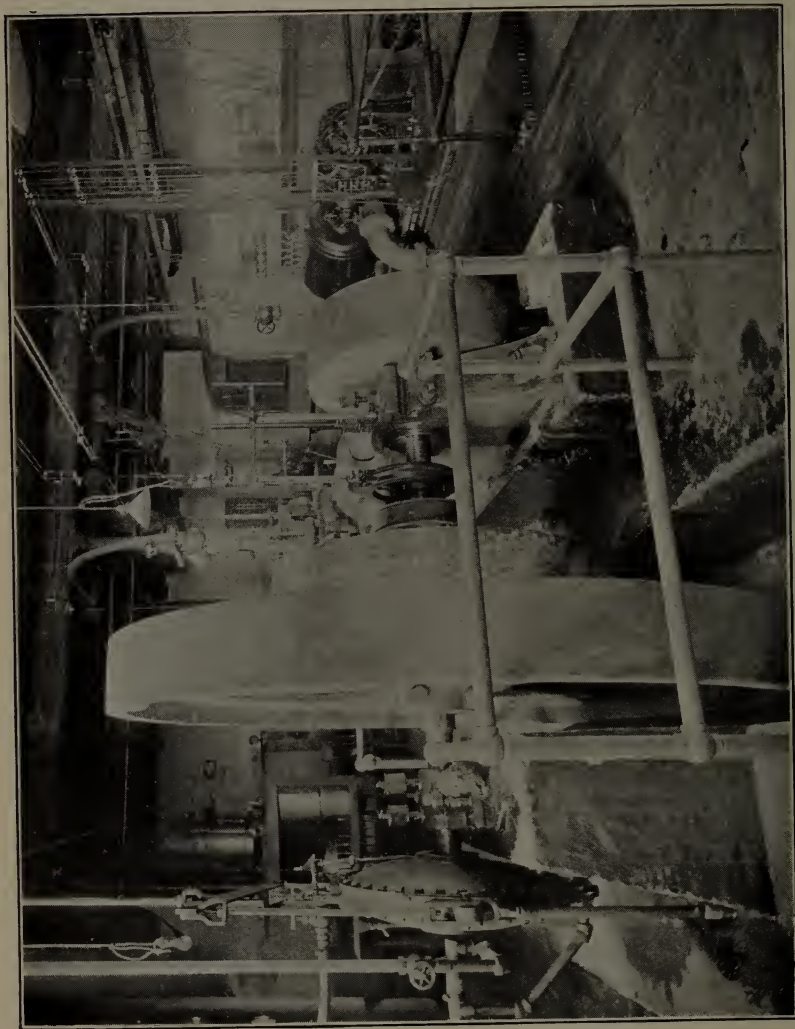
The applicant must have such knowledge of the following books as will enable him to discuss intelligently their subject matter, literary form and structure. He will also be expected to be familiar with the lives of the authors, and with the important historical events associated with the books.

For June and September, 1911:

Shakespeare's Julius Caesar.
Addison's Sir Roger de Coverley Papers.
Scott's Quentin Durward.
Dickens's Tale of Two Cities.
Irving's Sketch Book.
Coleridge's Ancient Mariner.
Burke's Speech on Conciliation with America.
Macaulay's Life of Johnson.

For June and September, 1912:

Shakespeare's Macbeth.
Addison's Sir Roger de Coverley Papers.
Scott's Ivanhoe.
Thackeray's Henry Esmond.
De Quincey's Joan of Arc and The English Mail Coach.
Tennyson's Gareth and Lynette, Lancelot and Elaine, and the Passing of Arthur.
Burke's Speech on Conciliation with America. -
Carlyle's Essay on Burns.



ENGINEERING LABORATORY

For June and September, 1913:

Shakespeare's Merchant of Venice.

Addison's Sir Roger de Coverley Papers.

Scott's Quentin Durward.

Dicken's David Copperfield.

Macaulay's Lord Clive and Warren Hastings.

Coleridge's Ancient Mariner.

Lowell's Vision of Sir Launfal.

Burke's Speech on Conciliation with America.

Stevenson's An Inland Voyage and Travels with a Donkey.

The applicant will be required to write two or three short themes on subjects taken from the above mentioned books. The examination in English, however, will test, primarily, the ability of the applicant to express himself with clearness and accuracy. In all cases, knowledge of the books will be considered of less importance than the ability to write clear and correct English. Evidence of serious weakness in spelling, punctuation, grammar and division into paragraphs will be considered sufficient ground for rating such work as a failure. The applicant may be required to correct examples of bad grammar and punctuation.

English written in any other admission examination may, if necessary, be considered by the examiner as part of the examination in English.

Modern Languages

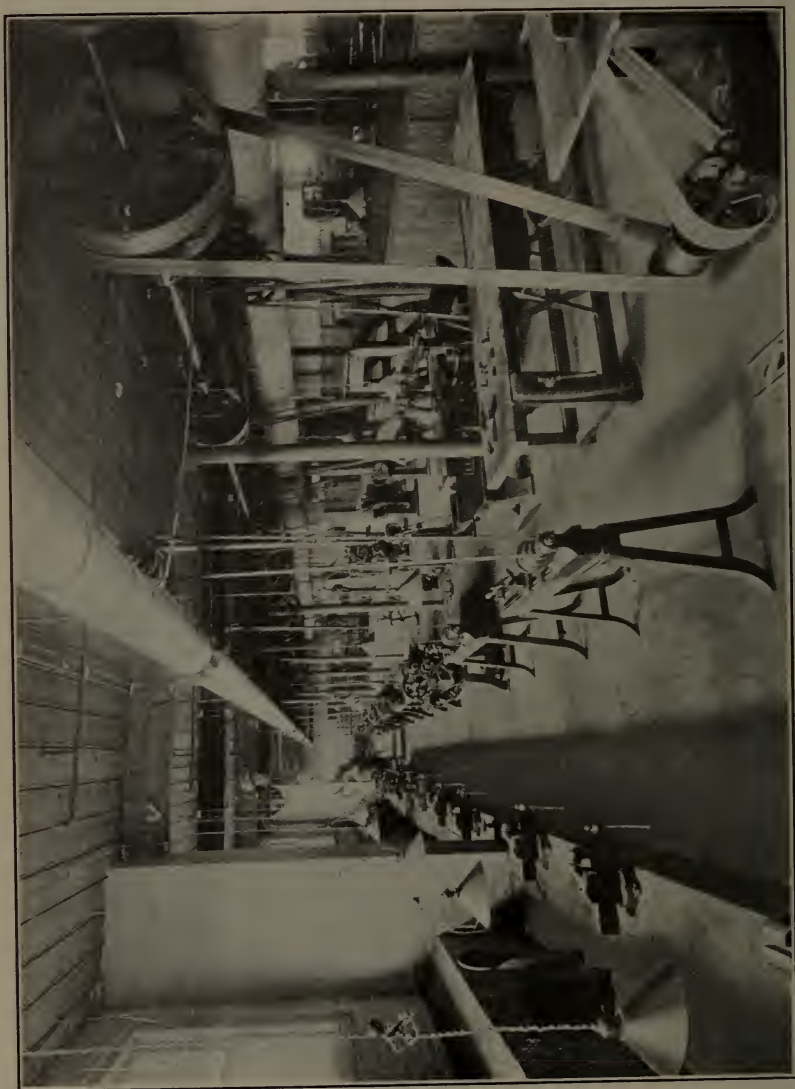
Beginning with June, 1911 all applicants must pass entrance examinations in either Elementary German or Elementary French, and all applicants entering upon certificate must state in which of these subjects or both they have received preparation and the ground covered by such preparation. The student must continue through the first year with the branch that is presented at entrance.

Students contemplating the Chemistry and Dyeing Course should present German; those entering for Textile Design, French; for all other courses either French or German. It is expected that within a few years, applicants will be required to present both French and German, and it is therefore recommended that all students now attending preparatory schools pursue courses in Elementary French and German.

German:

Entrance examination in German will be composed of two parts, both taken however, at the same time.

- (a) Translation of simple German prose into good idiomatic English.
- (b) Questions to test proficiency in grammar and simple English sentences to be rendered into German.



MACHINE SHOP

The requirements of Elementary German include the declension of articles, adjectives, pronouns, and nouns; the conjugation and inflection of weak and strong verbs; the use of the modal auxiliaries; the prepositions and their government; the principal parts of important verbs; the elementary rules of syntax and word order.

Among the texts recommended for prospective candidates are:

Andersen's Märchen.
Arnold's Fritz auf Ferien.
Baumbach's Die Nonna and Der Schwiegersohn.
Gerstäcker's Germelshausen.
Heyse's L'Arrabbiata.
Hillern's Höher als die Kirche.
Jensen's Die braune Erica.
Storm's Immensee.
Zschokke's Der zerbrochene Krug.

French:

Entrance examination in French will be composed of two parts, both taken, however, at the same time.

- (a) Translation of simple French prose into good idiomatic English.
- (b) Questions to test proficiency in grammar and simple English sentences to be rendered into French.

The requirements of Elementary French include the principal parts, conjugation and inflection of the regular and the more common irregular verbs; the singular and plural forms of nouns and adjectives; the uses of articles and partitive construction; the forms and positions of personal pronouns; and the simpler uses of the conditional and subjunctive.

Among the texts recommended for prospective candidates are:

About's Le roi des montagnes.
Bruno's Le tour de la France.
Daudet's easier short tales.
De la Bédollière's La mère Michel et son chat.
Eckmann — Chatrian's Madame Thérèse.
Foa's Contes Biographiques.
Halévy's L'Abbé Constantin.
Merimée's Colomba.
Extracts from Michelet.
Sarcey's Le siège de Paris.
Verne's Le tour du monde en quatre-vingts jours.

History

Applicants must show familiarity with the early settlements in America, the colonies, their government, the customs of the people and events which led to the establishment of the United States. They should be



FINISHING DEPARTMENT

informed concerning the causes and effects of the principal wars in which the country has been involved. Applicants should be prepared to consider questions involving a knowledge of Civil Government as well as historical facts, connected with the growth of this country up to the present time.

For June, 1912 and thereafter applicants should be familiar with the leading events of English History, particularly those which in any way influenced the history of the United States. The usual course offered by High Schools and Academies should be sufficient preparation for this requirement.

Preparation

Particular stress is laid upon a thorough grounding in mathematics including Algebra, Arithmetic and Plane Geometry, as these form the basis upon which the work of this school rests. While Solid Geometry is not required at the present time the student will find a knowledge of this subject very valuable in his subsequent work. A preliminary course in science, including Physics and Chemistry, serves to prepare the student's mind for the higher branches of these subjects and their application.

Advanced Standing

Candidates who may have received previous training in any of the subjects ordinarily taken in the regular course may present themselves for examination as per calendar. If a satisfactory rank be attained, they will be given such further work as will be best suited to their advancement.

Attendance Card

At the beginning of each term all students must fill out and file with the Principal on blank forms which are provided, a formal application for such subjects as are required in his course and for which he is sufficiently prepared, subject to the approval of the Principal. When an attendance card is once approved, no change can be made except through the Principal.

Application Blanks

A blank form of application for admission may be found at the end of this bulletin. This should be properly filled out by all applicants whether entering upon certificate from a preparatory school or presenting themselves for examinations.



FINISHING DEPARTMENT

Fees

The fee for the day course is \$100 per year for residents of Massachusetts, with the exception of the Chemistry and Dyeing Course, for which the fee is \$125 for Second and Third Year students. For First Year students taking the Chemistry and Dyeing Course the first term fee is \$60 and the second term fee \$52.50. For non-residents the fee for all courses is \$150 per year. Fee for students from foreign countries \$300 per year.

Three-fifths of the fee is charged for a single term and is payable on or before October 10, the balance on or before February 10, of each year. No bills will be sent. Students attending but one term will be charged three-fifths of the yearly fee. After payment is made, no fee or part thereof can be returned, except by special action of the Trustees.

Special students pay, in general, the full fee, but if a course be taken involving attendance at the school during a limited time, application may be made to the Principal for a reduction.

Students must provide their own books, stationery, tools, etc., and pay for any breakage or damage that they cause. The above fee includes free admission for any day student desiring to attend any of the evening classes in which there is accommodation.

For all first year students a minimum deposit of \$20 is required to cover the cost of breakage in the chemical laboratory, the unexpended balance to be returned to the student at the end of the year.

For all students in second or third years taking work in Chemistry or Dyeing Laboratories a deposit of \$15 per term is required. The unexpended balance will be returned at end of year.

An athletic fee of \$5.00 will be required of all male students attending in 1911-1912 and thereafter.

The fees for the evening classes are indicated under Evening Classes for which see page 31.

Fees are strictly payable in advance, and students whose fees remain unpaid after the above mentioned dates will not be admitted to classes.

All deposits must be made before students can be admitted for laboratory work.

Examinations

Examinations are held at the end of each term.

In general, the examinations cover the work of the preceding term, but at the end of the third year, candidates for diplomas may be examined on all of the preceding three years' work.

Examinations for students conditioned in first term subjects are held in May and examinations for students conditioned in the Final Examinations are held in September following.

If a student fails to clear a condition at the time appointed he will be required to repeat or drop the subject; and he cannot be admitted to subjects dependent thereon.



VIEW OF MANUFACTURED MATERIALS

Intermediate examinations are held every five weeks and these serve to inform the student concerning his standing and the progress made.

Daily work and regularity of attendance are considered in making up the reports of standing.

Continued or persistent absence (or tardiness) from the classes is considered reason to exclude a student from the class.

Records and Reports of Standing

Twice during each term informal reports are sent to all parents or guardians and to students who are of age; and at the end of each term formal reports are made.

The daily work of the student forms an important part of his record, and no pupil will be awarded the diploma unless this portion of his record is clear.

Books are prescribed for study, for entry of lecture notes and other exercises, and are periodically examined by the lecturers. The care and accuracy with which these books are kept are considered in determining standing.

Thesis

All candidates for the diploma of the school must file with the Principal not later than May 15, a report of original investigation, or research, written on a good quality of paper, 8 x 10 inches, with one inch margin at left, and 1-2 inch at right of each page; such thesis to have been previously approved by the head of the department in which it is made.

Graduate Course

Graduates of technical courses of other schools are invited to communicate with the Principal with reference to special courses in the textile studies. Previous training in the engineering branches will usually reduce materially the time necessary to complete any of the courses at this school. The advantages offered to such persons for special research work are unexcelled, and a most profitable course may be arranged.

The Regular Courses

The title of each of the regular courses is an indication of the particular nature of the course, unless it be in the case of Course III. There is a considerable demand for a general textile course in which the whole subject may be treated broadly, and this course is organized with this particular object in view. Certain general studies are included in each course, in order that in specializing, a too narrow view may be avoided.



BOILER ROOM

While it is always urged that regular courses be followed as far as possible, there is opportunity to take any of the subjects taught for which the student is prepared, providing the schedule will permit. All students contemplating a special course should consult with the principal.

Special Awards of Merit

For several years a friend of the school has offered prizes in the form of books to be awarded to the successful candidates on graduation day. These prizes are continued this year. The conditions in detail are as follows:

First:—Ten dollars to the student taking the regular Chemistry and Dyeing course in the Lowell Textile School, who shall be considered as having attained the highest scholarship in First Year Chemistry.

Second:—Five dollars to the student taking the regular Chemistry and Dyeing course in the Lowell Textile School, who shall be considered as having attained the second highest scholarship in First Year Chemistry.

Third:—Ten dollars to the regular student of the Chemistry and Dyeing course who shall be considered as having attained the highest scholarship during his second year.

Fourth:—Five dollars to the regular student of the Chemistry and Dyeing course who shall be considered as having attained the second highest scholarship during his second year.

Fifth:—Ten dollars to the regular Chemistry and Dyeing student of either the second or third year class who shall write the best article upon one of five subjects to be specified by the instructing staff of the Chemistry and Dyeing Department.

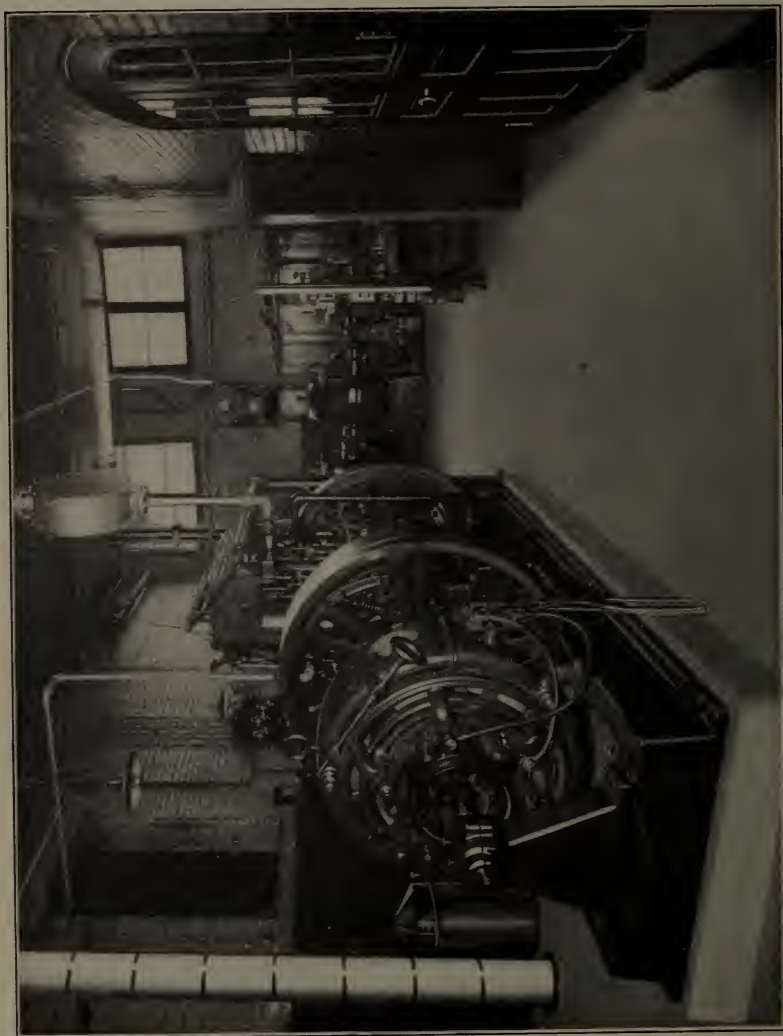
Sixth:—Twenty dollars to the regular student in the Chemistry and Dyeing course who shall present the best Thesis preparatory to graduation.

The above mentioned sums are to be invested in books which may be selected after graduation. In case no one is considered as being worthy of any particular scholarship prize the same may be withheld. The decision in such case shall rest with the judges.

Prize Offers for Textile Designs

The Arlington Mills make the following prize offers for textile design to students of the Lowell Textile School. Two competitions will be held each year, one open to all members of the day classes and the other to all members of the evening classes. First and second prizes will be given to the winners in each contest as follows:

1. Cash prize of \$25.00 to the student who presents the best design with full specifications which is suitable for worsted dress goods fabrics for women's wear.



GAS ENGINE UNIT—ENGINE ROOM

2. Cash prize of \$15.00 to the student who presents the second best design, with full specifications, applicable to the above fabrics.

Any contestant may present not more than five (5) different designs for any one of the above mentioned fabrics.

No contestant will be eligible for more than one prize.

Specifications should be made upon standard thesis paper. Only one side should be used and subject matter be either typewritten or presented in a clear, legible handwriting. With each design a statement must be submitted telling the kind of fabric and finish intended.

Any or all designs submitted may be retained by the donors and may become their property.

The judges will be appointed by the Arlington Mills.

All designs must be delivered to the Arlington Mills, 78 Chauncy St., Boston, on or before May 15th, 1911, accompanied by a sworn statement that the contestant has received no help and that the designs are entirely his own work, the object of the contest being to develop originality in the student.

The full name of a contestant must appear on the designs and specifications. In judging the relative merit of the various designs the neatness and care with which they are executed will be considered as well as the value of the designs from a manufacturer's point of view.

Diploma

The diploma of the School is awarded upon the satisfactory completion of any one of the regular courses, covering not less than three years, except where entrance is to advanced standing. In such cases at least one year's attendance is required.

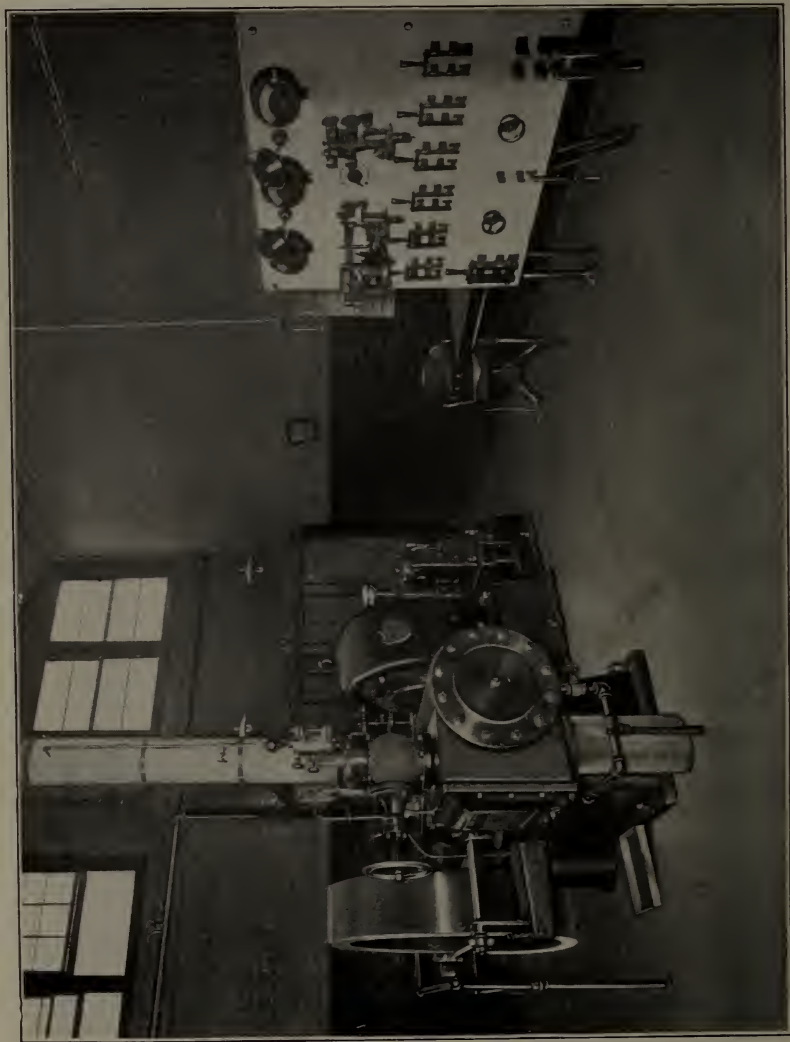
Medals of Honor

The National Cotton Manufacturers' Association offers annually a medal to that member of the third year class who shall have during his course attained the highest standing in the specified subjects required by the vote of the association.

Attendance

All regular students must attend all exercises of their course. Special students must attend exercises as per their Tabular View.

In case of absence explanation must be made to the instructor or the Head of the Department. The effect of such absence upon a student's standing in the respective study will rest with the Head of the Department, subject to the approval of the Principal.



STEAM ENGINE UNIT—ENGINE ROOM

If a student absents himself from any department to such an extent that in the mind of the Head of the Department he is endangering his standing, he shall be reported to the Principal.

If he continues his non-attendance he may be required to drop the subject and repeat it the following year.

If he is reported from several departments on account of non-attendance, he may be suspended from the school for the remainder of the school year.

Conduct

Students are required to return to the proper place all instruments or apparatus used in experimental work and to leave all machinery and apparatus with which they may experiment clean and in working order. All breakages, accidents, or irregularities of any kind must be reported immediately to the head of the department, or instructor in charge.

In cases of either day or evening students, irregular attendance, lack of punctuality, neglect of either school or home work, disorderly or ungentlemanly conduct or general insubordination, are considered good and sufficient reason for the immediate suspension of a student, and a report to the Trustees for such action as they deem necessary to take.

It is the aim of the Trustees so to administer the discipline of the school as to maintain a high standard of integrity and a scrupulous regard for trust. The attempt of any student to present as his own, work which he has not performed, or to pass any examination by improper means, is regarded by the Trustees as a most serious offense and renders the offender liable to immediate suspension or expulsion. The aiding or abetting of a student in any dishonesty is also held to be a grave breach of discipline.

Any student who violates these provisions will be immediately suspended by the Principal and the case reported at the following meeting of the Trustees for action.

Young men abounding in vitality when suddenly cut loose from home and established social environment to acquire an education at a residential school need especially the careful direction of more mature minds in the formation of new associations. The managements of all residential schools are aware that this fact is the cause of considerable anxiety on the part of parents and guardians. The responsibility thus placed upon those under whose care these pupils are committed is profoundly recognized.

The public schools are for boys and girls, the college for youth, the higher technical and professional schools of medicine, law, engineering, etc., are for men. It is now fully recognized that the fundamental idea of the general educational system, from the kindergarten to the college inclusive, should be the development and establishment of character, and it is therefore expected that those entering the technical schools will have



LIBRARY

made some progress in self-respect, self-denial and self-control. They enter substantially upon their life work when they matriculate at the higher technical schools and may be placed on their honor as to conduct and not be subject to an irritating and humiliating system of espionage outside of school hours.

In place of such espionage it is the policy of technical schools to rely mainly upon the discipline of the work of the course in connection with ample facilities for physical exercise in the various athletic games and sports, for which ample provision has been made at this school.

Pupils often err in conduct from thoughtlessness and lack of experience rather than through wilfulness, and unconsciously fall into bad habits because of the lack of intelligent warning and instruction. For this reason, it is proposed to give thorough instruction by lectures, covering the subjects of hygiene, the preservation of physical vigor, morals, thrift, the duties of citizenship, etc. A careful scrutiny will also be maintained by the instruction staff in order to detect in the students any tendency of relaxation in the work or attendance, and all reasonable effort will be made to maintain a high standard of scholarship and morals.

Library

The school library is supplied with leading textile books and with works dealing with science, art or industries allied to the textile trades. The leading textile papers are kept on file.

Sessions

The regular school sessions are in general from 8.30 a. m. to 12.30 p. m., and from 2 to 4.30 p. m., except Wednesdays and Saturdays when there is no session of the school in the afternoon. On Saturday afternoons the buildings are closed.

A tabular view designates the hours at which the various classes meet. This is rigidly adhered to and the student is marked for his attendance and work as therewith scheduled.

General

Students from a distance, requiring rooms and board in the city, may if they desire it, select the same from a list which is kept at the School. The cost of rooms and board in a good district is from \$6.50 per week upwards.

All raw stock and yarn provided by the School, and all the productions of the School remain, or become, the property of the Trustees, except by special arrangement, but each student is allowed to retain specimens of yarn or fabrics that he has produced, if mounted and tabulated

in accordance with the requirements of the school. It is understood that the Trustees may retain in the School such specimens of student's work as they may determine.

Apparatus used in the Dyeing or Chemical Laboratory is provided by the School, but a deposit must be made by the student at the beginning of the term sufficient to cover its cost, and this deposit will be returned to him at the close of the term, subject to such deduction as will reimburse the School for broken or damaged articles and material used.

Lockers are provided for the use of students, sufficiently capacious to contain clothing, books and tools. The student must provide a good padlock with duplicate keys, one of which must be delivered at the school office where it will be preserved for use while the student remains at school.

No books, instruments, or other property of the School are loaned to the students, to be removed from the premises except by special permission.

Materials

Students must purchase such tools, instruments, text books, and apparatus as may from time to time be recommended by the head of each department, and the cost of these for day students is from \$20 to \$25, and for evening students from \$1 upwards according to the subject studied.

Awards

Gold Medal, Paris Exposition, 1900, for general excellence. A special Medal, Merchants and Manufacturers Exposition, Boston, 1900. The Pan-American Medal awarded to the School, 1901. Gold Medal, Louisiana Purchase Exposition, 1904. Gold Medal, Lewis and Clarke Centennial Exposition, 1905.

Bulletins and Catalogue

All students registering and paying the regular fee for the course selected are entitled to the Bulletins and Catalogues when issued.

Special bulletins descriptive of the Chemistry and Dyeing Course, the Wool Manufacturing Course, the Cotton Manufacturing Course, the Textile Design Course and the Textile Engineering Course have been prepared and may be obtained upon application.

COURSES OF INSTRUCTION

In the column headed "Hours of Exercise" the numbers represent for each particular subject the total hours required for a period of fifteen weeks.

The letter and number which follow the subjects indicate the department in which the subject is given and the number of the subject in that department. For detail description of the same, see page 108.

The departments are indicated as follows:

Textile Engineering	B
Chemistry and Dyeing	C
Textile Design and Power Weaving	D
Languages and History	E
Cotton Yarns	F
Woolen and Worsted Yarns	G
Finishing	H
Physical Culture	I

By referring to the letter and number indicated under "Preparation" the student can ascertain what subjects are necessary in order that he may have a clear understanding of the subject which he is scheduled to take.

FIRST YEAR

FIRST TERM

(Common to all courses)

	Hours of Exercise
Mechanism B-5	60
Mechanical Drawing B-9	112
Mathematics B-1	45
Hand Loom Weaving and Elements of Design D-1	82
Elementary Chemistry C-1	150
English E-1	15
German or French E-2-3-4	30
Physical Culture I-1	15

COURSE 1.—COTTON MANUFACTURING

The Cotton Manufacturing Course is designed for students contemplating a career in the manufacturing of cotton yarns and cloths or allied industries.

During the first term of the year, the studies are common to all courses and include instruction in mechanism, mathematics, mechanical drawing and elementary chemistry. Laboratory work supplements the lectures in chemistry and hand loom weaving assists in illustrating the principles of textile design.

The work in the Cotton Yarn Department comprises instruction in all the processes from the bale to the finished yarn. The instruction consists of lectures upon the machines and processes, and laboratory work upon the machines themselves. In the laboratory each student is required to make exhaustive tests upon each machine and all the settings and adjustments possible. The third year's work in this department is largely devoted to lectures upon the manufacture of specialties, waste products, etc., and special laboratory work, special tests upon yarns and fabrics, mill planning with regard to the arrangement of machinery and other work of an advanced nature.

The course in chemistry consists of lecture and laboratory work on inorganic and organic chemistry followed by instruction in textile chemistry and dyeing, including a short course in the dyeing laboratory.

The work in mechanism is followed by steam engineering, electricity, hydraulics and mill engineering. The mechanical drawing taken in connection with these subjects augments this instruction as well as provides opportunity for students to become skilled in draughting.

The course in textile designing, cloth analysis, and cloth construction includes lectures on plain and fancy weaves and Jacquard work, the analysis of all commercial fabrics, and designs for the same. During the third year of this course students in this department specialize on cotton fabrics.

Power weaving is taken up during the second and third years. Commencing with lectures and practice upon plain looms, the student is taken through dobby and box-loom weaving to Jacquards.

A course in knitting taken during the third year includes the manufacture of hosiery and underwear. There is also a course of lectures on the finishing of cotton fabrics.

For detail description of the subjects see page 108.

COURSE I.—COTTON MANUFACTURING

FIRST YEAR

(*For First Term see page 95*)

SECOND TERM

	Hours of Exercise		Hours of Exercise
Cotton Carding, Drawing and Spinning	F-1 127	Mechanism	B-5 45
Textile Design, Cloth Anal- ysis, Hand Loom Weav- ing	D-1 93	Mathematics	B-1 30
Elementary Inorganic and Organic Chemistry	C-1 75	Machine Drawing	B-10 75
		German	E-2, 3 30
		English	E-1 15
		Physical Culture	I-1 15

SECOND YEAR

FIRST TERM

Cotton Carding, Drawing and Spinning	F-1 248	Machine Drawing	B-11 37
Textile Design	D-2 60	Steam Engineering	B-13 30
Power Weaving	D-9 30	Weaving Mechanism	B-7 30
Textile Chemistry and Dye- ing	C-9 30	Physics	B-12 30
		Industrial History	E-5 15

SECOND TERM

Cotton Spinning	F-2 180	Machine Drawing	B-11 30
Textile Design	D-2 60	Hydraulics	B-14 10
Power Weaving	D-9 68	Strength of Materials	B-16 20
Textile Chemistry and Dye- ing Lecture	C-9 15	Physics (Elementary Elec- tricity)	B-24 45
Dyeing Laboratory	C-11 67	Industrial History	E-5 15

THIRD YEAR

FIRST TERM

Cotton Yarn Manufacture	F-3 180	Power Weaving	D-10 195
Knitting	F-4 30	Cotton Finishing	H-2 30
Textile Design, Cloth Con- struction	D-6, 7 30	Mill Engineering	B-20 30
		Advanced Electricity	B-26 15

SECOND TERM

Cotton Yarn Manufacture	F-3 210	Power Weaving	D-10 135
Knitting	F-4 30	Cotton Finishing	H-2 30
Textile Design, Cloth Con- struction	D-6, 7 60	Mill Engineering	B-20 45
		Thesis	

COURSE II.—WOOL MANUFACTURING

The course of Wool Manufacturing is arranged for those who contemplate a career in the manufacture of woollen or worsted fabrics. It includes instruction in all of the varied processes employed in adapting the wool fibre to cloth, namely,—sorting, scouring, carding, combing, spinning, designing, weaving, dyeing and finishing. The work is carried on by lectures, recitations and practical work in the laboratories.

Following the first term, which is common to all courses, the student in his second term commences work in the Woollen and Worsted Laboratory, and through systematic steps is acquainted with the machines employed in the first steps of yarn manufacturing. At the same time lectures are given upon the many kinds of wool, variation in quality, grades, uses, etc., as influenced by the locality where grown. This is followed by practical work on the sorting table.

The second and third years cover spinning of woollen yarn and worsted yarn by the Bradford and French systems, also the manufacture of tops, including combing, gilling and back washing. Scouring and carbonizing are taken up in detail by lectures and by practical work.

The general chemistry of the first year is followed by textile chemistry and dyeing in the second year. This includes a short course in the Dyeing Laboratory.

Textile design, cloth analysis and construction are continued from the first year throughout the course, the work being applied especially to woollen and worsted goods. Weaving on power looms commences in the second year and continues through the third.

Lectures on finishing commence with the third year and are augmented by extensive practice with the machines in the Finishing Department.

Work in the Engineering Department extends throughout all three years and includes mechanical drawing, properties of saturated steam, electricity and hydraulics. The practical application of the principles studied in these subjects is brought out forcibly in the work on mill engineering, where mill design and construction are considered. A short course covering methods employed in the testing of fibres, yarns and cloths, together with laboratory work in the manipulation of certain physical apparatus, is given in the third year.

For detail description of the subjects see page 108.

COURSE II.—WOOL MANUFACTURING

FIRST YEAR

(*For First Term see page 95*)

SECOND TERM

		Hours of Exercise			Hours of Exercise
Woolen Carding and Spinning	G-2	127	Mechanism	B-5	45
Textile Design, Cloth Analysis, Hand Loom Weaving	D-1	98	Mathematics	B-1	30
Elementary Inorganic and Organic Chemistry	C-1	75	Machine Drawing	B-10	75
			German	E-2,3	30
			English	E-1	15
			Physical Culture	I-1	15

SECOND YEAR

FIRST TERM

Fibres; Wool Sorting, Scouring and Carbonizing	G-1	248	Machine Drawing	B-11	37
Textile Design	D-3	60	Steam Engineering	B-13	30
Power Weaving	D-9	30	Weaving Mechanism	B-7	30
Textile Chemistry and Dyeing	C-9	30	Physics	B-12	30
			Industrial History	E-5	15

SECOND TERM

General Wool Yarn Manufacture	G-3	180	Dyeing Laboratory	C-11	67
Textile Design	D-3	60	Machine Drawing	B-11	30
Power Weaving	D-9	68	Hydraulics	B-14	10
Textile Chemistry and Dyeing Lecture	C-9	15	Strength of Materials	B-16	20
			Physics (Elementary Electricity)	B-24	45
			Industrial History	E-5	15

THIRD YEAR

FIRST TERM

General Wool Yarn Manufacture	G-3	128	Power Weaving	D-10	202
Knitting	F-4	30	Woolen and Worsted Finishing	H-1	75
Textile Design, Cloth Construction	D-6, 7	30	Mill Engineering	B-20	30
			Advanced Electricity	B-26	15

SECOND TERM

General Wool Yarn Manufacture	G-3	180	Power Weaving	D-10	120
Knitting	F-4	30	Woolen and Worsted Finishing	H-1	75
Textile Design, Cloth Construction	D-6, 7	60	Mill Engineering	B-20	45
			Thesis		

COURSE III.—TEXTILE DESIGN

The general course in Textile Design is planned to meet the demand of young men for a technical training in the general processes of textile manufacturing, but with particular reference to the design and construction of fabrics. To this end a foundation is laid in the first year by instruction in mechanics, mechanical drawing, mathematics, chemistry and the elementary principles of designing and weaving. The student is required to pursue a course in the yarn departments, both cotton and wool. By this method he acquires a knowledge of the manufacture of cotton yarns from the bale to the yarn and of woolen and worsted yarns from the fleece through the varied processes of manufacturing woolen yarn or worsted yarn by both the French and Bradford Systems.

Throughout his entire course he receives instruction in design, cloth analysis and construction of all the standard cloths, viz.—trouserings, coatings, suitings, blankets, velvets, corduroys, plushes, etc. This leads into advanced work in Jacquard designing, being supplemented by work in decorative art.

The course in general inorganic and organic chemistry of the first year leads to the subjects of textile chemistry and dyeing in the second year. The instruction includes a short course in the dyeing laboratory.

Power weaving commences with the second year and continues throughout the course.

During the third year the student receives instruction in the finishing of woolen and worsted cloths. This instruction is given by means of lectures and laboratory work.

The instruction in the Engineering Department is carried along parallel with the other subjects of the course and includes steam, electricity and hydraulics. In the third year mill engineering is taken up and serves to show the application of the principles studied in the previous years. Mechanical drawing extends throughout all three years and finds extensive application in the machine departments.

For detail description of the subjects see page 108.

COURSE III.—TEXTILE DESIGN

FIRST YEAR

(*For First Term see page 95*)

SECOND TERM

	Hours of Exercise		Hours of Exercise
Textile Design, Cloth Analysis, Hand Loom Weaving	D-1 165	Mechanism	B-5 45
Cotton Carding, Drawing and Spinning	F-1 60	Mathematics	B-1 30
Elementary Inorganic and Organic Chemistry	C-1 75	Machine Drawing	B-10 75
		French	E-4 30
		English	E-1 15
		Physical Culture	I-1 15

SECOND YEAR

FIRST TERM

Textile Design, Decorative Art, Hand Loom Weaving	D-2, 3, 4, 5 183	Textile Chemistry and Dyeing	C-9 30
Cotton Carding, Drawing and Spinning	F-1 90	Machine Drawing	B-11 37
Power Weaving	D-9 60	Steam Engineering	B-13 30
		Weaving Mechanism	B-7 30
		Physics	B-12 30
		Industrial History	E-5 15

SECOND TERM

Textile Design, Decorative Art, Hand Loom Weaving	D-2, 3, 4, 5 187	Dyeing Laboratory	C-11 37
Woolen Carding and Spinning	G-2 142	Hydraulics	B-14 10
Power Weaving	D-9 38	Strength of Materials	B-16 20
Textile Chemistry and Dyeing Lecture	C-9 15	Physics (Elementary Electricity)	B-24 45
		Industrial History	E-5 15

THIRD YEAR

FIRST TERM

Textile Design, Cloth Construction, Decorative Art	D-6, 7, 8 158	Power Weaving	D-10 120
Fibres; Wool Sorting, Scouring and Carbonizing	G-1 112	Woolen and Worsted Finishing	H-1 75
		Mill Engineering	B-20 30
		Advanced Electricity	B-26 15

SECOND TERM

Textile Design, Cloth Construction, Decorative Art	D-6, 7, 8 195	Power Weaving	D-10 127
General Wool Yarn Manufacture	G-4 68	Woolen and Worsted Finishing	H-1 75
		Mill Engineering	B-20 45
		Thesis	

COURSE IV.—CHEMISTRY AND DYEING

The regular course in Chemistry and Dyeing is especially recommended to those who intend to enter upon any branch of textile coloring, bleaching, or the manufacture or sale of the various dyestuffs and chemicals used in the textile industry. The theory and practice of all branches of dyeing, printing, bleaching, scouring, etc., are taught by lecture work supplemented with a large amount of laboratory work.

During the first year general chemistry, including both inorganic and organic, is taught by lectures and laboratory work, and this is supplemented during the second term by qualitative analysis and stoichiometry.

Advanced inorganic as well as advanced organic chemistry are studied throughout the second year as a continuation of the elementary chemistry of the first year, but the greater part of the time is spent upon quantitative analysis, industrial chemistry and textile chemistry and dyeing.

The third year is devoted to advanced textile chemistry and dyeing, dye testing, dye matching, woolen and worsted finishing, calico printing and cotton finishing, quantitative analysis, industrial chemistry, physical chemistry and thesis work.

The work is taken up in a thorough manner and has been so arranged that the amount of time spent in the laboratories and in class-room work balance each other. Sufficient studies are taken in the other departments to broaden the knowledge of the student in regard to textile work in general, and he is given such training as the time will permit in mathematics, mechanical drawing, modern languages and designing.

The student who conscientiously performs all of the prescribed laboratory work and the practice work should be proficient not only in dyeing and textile printing, but should be well trained in the methods of analysis and the testing of the various chemicals, mordants and dyestuffs so extensively used in the textile industry.

For detail description of the subjects see page 108.

COURSE IV.—CHEMISTRY AND DYEING

FIRST YEAR

(For First Term see page 95)

SECOND TERM

	Hours of Exercise		Hours of Exercise
Elementary Inorganic and Organic Chemistry	C-1 75	Mathematics	B-1 30
Stoichiometry	C-3 30	Machine Drawing	B-10 30
Qualitative Analysis	C-2 202	Cloth Analysis	D-1 30
Mechanism	B-5 45	German	E-2, 3 30
		English	E-1 15
		Physical Culture	I-1 15

SECOND YEAR

FIRST TERM

Advanced Inorganic Chem- istry	C-4 45	Dyeing Laboratory	C-10 82
Advanced Organic Chem- istry	C-5 30	Industrial Laboratory	C-12 75
Quantitative Analysis	C-6 150	Steam Engineering	B-13 30
Textile Chemistry and Dye- ing Lecture	C-9 30	Physics	B-12 30
		Industrial History	E-5 15

OPTIONS

Power Weaving	Advanced Mathematics
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SECOND TERM

Advanced Inorganic Chem- istry	C-4 30	Textile Chemistry and Dye- ing Lecture	C-9 15
Advanced Organic Chem- istry	C-5 30	Dyeing Laboratory	C-10 232
Quantitative Analysis	C-6 133	Physics (Elementary Elec- tricity)	B-24 45
		Industrial History	E-5 15

THIRD YEAR

FIRST TERM

Quantitative Analysis	C-7 165	Dyeing Laboratory	C-15 225
Physical Chemistry	C-8 30	Woolen and Worsted	
Industrial Chemistry	C-13 30	Finishing	H-1 30
Advanced Textile Chem- istry and Dyeing	C-14 30		

SECOND TERM

Quantitative Analysis	C-7 127	Calico Printing and Cot- ton Finishing	C-14 45
Physical Chemistry	C-8 15	Engineering Chemistry	C-16 15
Industrial Chemistry	C-13 30	Industrial Analysis	C-17 37
Advanced Textile Chem- istry and Dyeing	C-14 15	Thesis	C-19 113
Dye Testing and Color Matching	C-15 45	Woolen and Worsted Finishing	H-1 68

COURSE VI.—TEXTILE ENGINEERING

The course in Textile Engineering is planned to train the student to meet intelligently the engineering problems of the textile industry as well as to provide him with the essentials of the processes and machines in the varied branches of this industry.

The student is first thoroughly grounded in the broad fundamental principles of science and mathematics underlying all engineering work and textile manufacturing with its many closely allied industries. The most important of the preliminary subjects are mathematics, physics, mechanics and mechanism, and mechanical drawing. The work in mechanism and drawing is particularly thorough and the practical uses of these subjects are considered of first importance. The study of physics while taking up the usual branches included in this subject is given with special reference to problems involved in the physical testing of fibres, yarns and fabrics, etc. The student is required to spend a portion of his time during the course upon the subjects of cotton yarns, woollen and worsted yarns, and power weaving with practical work in each branch. During his first year he has a brief course in the elements of design, and in his second year he pursues a course in textile chemistry and dyeing which is preceded in the first year by the necessary preliminary course in elementary organic and inorganic chemistry. Special importance is attached to the study of power generation, transmission, and measurement and courses with laboratory practice are given in the elements of steam, electrical and hydraulic engineering, to familiarize the student with the means, methods and results available in the modern practice of these branches.

The recently equipped engineering laboratory together with the extensive power plant of the school affords opportunities for a varied line of experimental work including boiler, engine, turbine, generator and pump tests. Systematic instruction in the most approved methods of machine shop practice is provided in the shop which is fully equipped with the best makes of modern tools. This feature of the course is considered a most valuable adjunct to the training of a textile engineer.

The work in mill engineering covers a wide range of subjects including mill construction with calculations and drawings, mill heating, lighting, fire protection, electric driving, etc. The arrangement of plants and machinery for the most economical power distribution and efficient "organization" is also taken up in detail, data for problems being taken from actual cases and the solutions compared with those of some of our best known mill engineers.

For detail description of the subjects see page 108.

COURSE VI.—TEXTILE ENGINEERING

FIRST YEAR

(For First Term see page 95)

SECOND TERM

	Hours of Exercise		Hours of Exercise
Mechanism	B-5 45	Elementary Inorganic and	
Mathematics	B-2 45	Organic Chemistry	C-1 75
Machine Drawing	B-10 75	Textile Design, Cloth Anal-	
Graphic Statics	B-6 45	ysis	D-1 60
Mechanical Laboratory	B-8 37	German	E-2, 3 30
Cotton Carding, Drawing		English	E-1 15
and Spinning	F-1 60	Physical Culture	I-1 15

SECOND YEAR

FIRST TERM

Cotton Carding, Drawing		Steam Engineering	B-13 30
and Spinning	F-1 112	Weaving Mechanism	B-7 30
Power Weaving	D-9 30	Machine Shop Practice	B-18 75
Textile Chemistry and Dye-		Engineering Laboratory	B-17 38
ing	C-9 30	Physics	B-12 30
Mathematics	B-3 45	Industrial History	E-5 15
Machine Drawing	B-11 75		

SECOND TERM

Woolen Carding and Spin-		Thermodynamics	B-15 15
ning	G-2 127	Machine Shop Practice	B-18 60
Power Weaving	D-9 38	Engineering Laboratory	B-17 75
Textile Chemistry and Dye-		Physics (Elementary Elec-	
ing	C-9 15	tricity)	B-24 45
Mathematics	B-3 45	Electrical Laboratory	B-25 15
Machine Drawing	B-11 45	Physical Laboratory	B-23 15
Hydraulics	B-14 10	Industrial History	E-5 15
Strength of Materials	B-16 20		

THIRD YEAR

FIRST TERM

Fibres; Wool Sorting,		Mathematics	B-4 30
Scouring and Carbonizing	G-1 90	Mill Engineering	B-19 127
Power Weaving	D-10 38	Machine Shop Practice	B-18 60
Woolen and Worsted		Engineering Laboratory	B-22 37
Finishing	H-1 30	Advanced Electricity	B-26 30
Cotton Finishing	H-2 30	Electrical Laboratory	B-27 38

SECOND TERM

General Wool Yarn Manu-		Mill Engineering	B-19 105
facture	G-4 75	Machine Shop Practice	B-18 60
Woolen and Worsted		Engineering Laboratory	B-22 45
Finishing	H-1 67	Power Plants	B-21 15
Cotton Finishing	H-2 30	Electrical Laboratory	B-27 38
Mathematics	B-4 45	Thesis	

POST GRADUATE COURSES

The need of extending the work given in the various departments is now limited to the available time in a three year course. Graduates from one course have in their experience found it desirable to have a knowledge of subjects given in some one of the other courses. Successful manufacturers find that a general knowledge of the sociological, industrial and business world is quite as important in the operation of their plant as the technical training required in the manufacturing.

That these requirements may be met and that students attending this school may have some acquaintance with general business methods and principles, optional Post Graduate courses are offered, beginning with the school year of 1911 and 1912.

These have been planned with a view of adding to the work now required in any one of the three year manufacturing or engineering courses instruction in the methods in other branches of textile manufacturing not covered in the three year course, also advanced work in Engineering, Mathematics and Physics. Thus, students who have a three year course in Cotton Manufacturing will add, in the fourth year, instruction in Wool Manufacturing, those who have taken Wool Manufacturing will add a course in Cotton Manufacturing. Students in the Design Course will add work in Decorative Art and its application in Jacquard Design. The Engineering and Chemistry and Dyeing Courses offer in the fourth year advanced work in the theory and application which the time scheduled for the three years will not permit.

All courses will include instruction which may be grouped under the head of Business Administration. The elements of Accounting, Business Law, Methods of Banking, Corporation Organization and Economics will be taken up under this head in so far as they apply to the Textile Industry. Under this same course will come instruction in the principles and methods employed to improve the efficiency of processes, labor and machines. It is not the object to train experts in these particular branches, but rather to acquaint with general business methods, principles and organization found in daily practice, those who expect to enter the industry and look forward to ultimately occupying executive positions.

Post Graduate Course—I-A

Students to pursue this course must hold a diploma from the Cotton Manufacturing Course.

	Hours per Week			Hours per Week	
	1st Term	2d Term		1st Term	2d Term
Physical Laboratory	2	2	Business Administration	3	2
Mathematics	3	3	Electrical Engineering	4	2
Mill Engineering	4	4	Applied Mechanics	2	2
Machine Shop	3	3	Wool Yarns	5	5
Pattern Shop	2	2	Thesis		6
German	3	3			
				31	34

Post Graduate Course—II-A

Students to pursue this course must hold a diploma from the Wool Manufacturing Course.

Physical Laboratory	2	2	Business Administration	3	2
Mathematics	3	3	Electrical Engineering	4	2
Mill Engineering	4	4	Applied Mechanics	2	2
Machine Shop	3	3	Cotton Yarns	5	5
Pattern Shop	2	2	Thesis		6
German	3	3			
				31	34

Post Graduate Course—IV-A

Students to pursue this course must hold a diploma from the Chemistry and Dyeing Course.

Quantitative Analysis	6	5	Organic Chemistry		
Industrial Analysis			Laboratory	8	8
Advanced Textile Chemistry and Dyeing	1		Microscope, Spectroscope and Polariscopes		5
Dyeing Laboratory	5		Technical Work	2	
Engineering Chemistry	1		Business Administration	3	2
Advanced Organic Chemistry	1		Thesis	7	13
				34	33

Post Graduate Course—VI-A

Students to pursue this course must hold a diploma from the Textile Engineering Course.

Physical Laboratory	3	3	Knitting	2	
Applied Mechanics	2	2	Business Administration	3	2
Electrical Engineering	5	5	Pattern Shop	4	4
German	3	3	Thesis	6	10
Mill Engineering	6	5			
				34	34

SUBJECTS OF INSTRUCTION

ENTRANCE REQUIREMENTS

The requirements for admission to this school are given in detail on pages 73 to 81.

Applicants who are not graduates of a regular four year course of a High School or Academy must pass examinations in the following subjects:

- A-1 Algebra.
- A-2 Plane Geometry.
- A-3 Arithmetic.
- A-4 English.
- A-5 German
- OR
- A-6 French.
- A-7 American History.

TEXTILE ENGINEERING DEPARTMENT—B

Mathematics (Algebra, Trigonometry)—B-1

PREPARATION: A-1, A-2

This subject is given in the first year with the view of consolidating the separate branches of Mathematics that have been given in previous years. The progress of the school has been such as to necessitate the introduction of Higher Algebra and Trigonometry, in the early part of the first term, and hence, as in other technical schools, it has resulted in a combined course. This course is presented by means of lectures, text-books, class and problem work, and consists essentially of the following: Progressions, Graphical Representation, Permutations and Combinations, Logarithms, Slide Rule, Trigonometry, Binomial Theorem, Partial and Continued Fractions, Series, Theory of Equations, Significant Figures, and Plotting of Scientific Data.

[COURSES I-II-III-IV]

Mathematics

Algebra, Trigonometry, Elements of Analytical Geometry, Elements of Differential Calculus)—B-2

PREPARATION: A-1, A-2

In addition to the subjects outlined under Mathematics B-1 students in the Textile Engineering Course take the following subjects during the first year: Straight Line Equation, Point of Division of a Line, Equation of Parallel and Perpendicular Lines, Derivatives, Equation of the Circle, Equation of the Tangent to a Circle, and Elementary Problems on Differential Calculus.

[COURSE VI]

Mathematics
(Analytical Geometry, Differential Calculus, Elements of
Integral Calculus)—B-3

PREPARATION: B-2

This is a continuation of the work of the first year which is taken by students in the Textile Engineering Course. It treats of the following subjects: Formulae of Differentiation, Conic Sections, Transformation of Co-ordinates, Maxima and Minima, Direction of Curves, Center and Radius of Curvature, Problems on Differential Calculus, Elements of Integral Calculus, Integration as a Summation, and Plane Areas. The above are treated in both Rectangular and Polar Co-ordinates.

[COURSE VII]

Mathematics. (Applied Calculus)—B-4

PREPARATION: B-3

This is taken during the third year. The subjects are treated in the following order: Formulae of Integration, Integration by parts, Integration by Substitution, Successive Integration, Evaluation of Integrals, Center of Gravity, Center of Pressure, Total Pressure, Moment of Inertia.

The last ten weeks of the second term are spent on the Application of Mathematics to Engineering problems, including the Derivation of Bending Moment and Deflection Formulae for Standard Beams, the Derivation of the Expressions for the Moment of Inertia of Standard Sections, and Problems in Mechanics, Physics, Thermo-dynamics, and Electricity.

[COURSE VI]

Mechanics and Mechanism—B-5

PREPARATION: B-1 OR B-2. TAKEN SIMULTANEOUSLY

These subjects are a necessary preparation for all courses and are taken in one hundred and five hours of lectures and recitations covering the whole of the first year. The fundamental principles of these subjects are considered of the greatest importance and the applications and problems are selected with special reference to their practical uses in textile machinery. The large variety of mechanism applications met in textile machines makes this course an essential one as a proper preparation for the student's later work in spinning and weaving. Some of the subjects treated in this course are:

MECHANICS

MECHANISM

Work, power and energy.

Linear and angular velocity.

Principle of moments.

Belting calculations.

Simple and compound levers.

Gears and gear trains.

Differential and common pulleys.

Cam and cone pulley design.

Jack screw and worm and wheel.

Linkage problems.

Parallelogram and triangle of forces.

Intermittent motions.

Inclined plane and wedge.

Differential and epicyclic trains.

[ALL COURSES]

Graphic Statics—B-6

PREPARATION: B-5

Forty-five hours are assigned to this course in the second term of the first year and the work is presented by lectures and recitations. First are considered mathematical and graphical conditions for equilibrium for any system of forces and the subjects of center of gravity and funicular polygons are introduced. Then follow problems on bridge and roof trusses under various conditions of dead, live, wind and snow loading. Masonry arches are finally considered.

[COURSE VI]

Weaving Mechanism—B-7

PREPARATION: B-5. TAKEN SIMULTANEOUSLY WITH D-9

This course consists of thirty lectures given during the first term of the second year and is required by all the regular students taking power weaving. A thorough analysis of all the important motions of power weaving is undertaken and the treatment is by graphical and analytical methods. The object of this course is to so familiarize the student with the theory of the mechanism of the loom that the time spent in the weave room on loom fixing will be used to the best advantage.

[COURSES I-II-III-VI]

Mechanical Laboratory—B-8

PREPARATION: B-5

This work is given during the second term of the first year and is supplementary to the courses in Mechanics, Mechanism and Graphic Statics. Especial importance is attached to the demonstration of the fundamental principles of these subjects. Some of the experiments and tests done in this course are as follows:

- Determination of coefficient of friction.

- Proof of principle of moments.

- Proof of principle of work.

- Efficiency test of various hoisting and lifting appliances, such as tackle and fall, worm block, differential and triplex blocks, jack screws, wedges, etc.

- Experimental proofs of the principles of graphic statics.

- Efficiency tests on belt transmissions including measurement of belt tensions, coefficient of friction, slip, etc.

- Tests on various types of absorption dynamometers.

- Calibration of transmission dynamometer.

- Power measurements on textile machinery with differential dynamometer.

- Measurement of friction of steam engine.

[COURSE VI]

Mechanical Drawing—B-9

PREPARATION: A-2. TAKEN SIMULTANEOUSLY WITH B-5

This course is taken by all regular students during the first term of the first year. The weekly program consists of one lecture and six and one-half hours in the drawing room. This subject is considered of the greatest importance as a preparation for the student's future work and the practical usefulness of drawing of this character is fully emphasized. The course is systematically laid out covering in order the following divisions:

Care and use of drawing instruments.

Geometrical constructions.

Elements of projections and descriptive geometry.

Isometric projection.

Developments with practical applications.

Sketching practice on machine details.

[ALL COURSES]

Machine Drawing—B-10

PREPARATION: B-9

This work is the continuation of the mechanical drawing and is pursued throughout the entire second term of the first year. This work is wholly of a practical character and includes sketching from textile machinery details, working scale detail and assembly drawing, tracing and blue printing. Students in Textile Engineering being assigned additional time in the drafting room, are enabled in many cases to complete a full set of detail drawings for an entire machine. They are also given the rudiments of machine design to supplement the work in strength of materials and machine shop practice.

[ALL COURSES]

Machine Drawing—B-11

PREPARATION: B-5, B-9, B-10

During the second year a period of two and one-half hours per week is devoted to advanced graphical mechanism problems. The data for all of these problems is in every case taken directly from some of the textile machines that the students meet in other departments. These problems include cam designs for builder motions, mule scroll layouts, Scaife builder motion analysis, fly frame cone design, mule quadrant motion, analysis of camless winder and a number of others of similar character.

[FIRST TERM—COURSES I-II-III-VI]

[SECOND TERM—COURSES I-II-VI]

Physics—B-12

PREPARATION : B-1 OR B-2

This course is given during the first term of the second year and serves especially as a preparation for Steam Engineering, Hydraulics, Electricity and the Study of Color. The subject is presented by means of lectures, recitations, problems, and reference books. The lectures deal chiefly with the application of the various physical laws and principles with the view of their adaptation to the above subjects; while the reference books are used to supplement the lectures. The subjects taken up are essentially as follows: Gravitation, Moving Bodies, Mechanics, Elasticity, Hydrostatics, Elements of Hydraulics, Properties of Fluids and Gases, and the Theory of Sound. These subjects are followed by a series of lectures on heat phenomena dealing with the Generation of Heat, Thermometry, Calorimetry, Transfer of Heat, its Effect on Solids, Liquids, and Gases, and problems such as lead up to the Elements of Steam Engineering.

The latter part of the course is devoted to the discussion of the laws governing the Nature, Propagation and Transmission of Light waves, special stress being laid on interference, reflection and refraction, mirrors, lenses, microscope, spectroscope, photometer, etc. Particular attention is given to the color effects produced by the combination of different colors in connection with Maxwell's Color Diagram and the Young Helmholtz Theory of Color Sensation.

[ALL COURSES]

Steam Engineering—B-13

PREPARATION : B-5. TAKEN SIMULTANEOUSLY WITH B-12

This course consists of forty-five lectures and is taken by all regular students during the second year. The purpose of this work is to familiarize the student with the essentials of power generation and the means and methods of modern practice in steam engineering.

The different types of boilers, engines, pumps, condensers, turbines, and other important features of a steam plant are first considered with reference to their construction and general arrangement. The remainder of the course is devoted to a thorough study of these elements of a power plant from the standpoint of the heat phenomena upon which their operation and efficient performance depend. Practice with the steam engine indicator is included in this work and also engine and boiler testing.

[ALL COURSES]

Hydraulics—B-14

PREPARATION: B-5, B-12

In the second term of the second year this subject is presented in a course of ten lectures covering the principles of hydraulics, including hydrostatics, measurements of flow of water through orifices, pipes, nozzles and over weirs. The different types of turbines are studied with results of tests and rating tables. Course VI students pursue this course to greater length, supplemented by experiments in the laboratory.

[COURSES I-II-III-VI]

Thermodynamics—B-15

PREPARATION: B-13

This course of fifteen lectures is taken in the second term of the second year and is in the nature of more advanced instruction in Steam Engineering. Importance is attached to the fundamental principles of this subject, especially in their application to the steam engine, turbine and gas engines.

[COURSE VI]

Strength of Materials—B-16

PREPARATION: B-5

This course, which consists of twenty lectures in the second term of the second year, is designed to give the student such a working knowledge of this important study, as will fit him to cope with such problems as he will most often meet in his work in the textile field. It includes the design of tension rods, beams, columns, riveted joints, trussed beams, etc.

[ALL COURSES]

Engineering Laboratory—B-17

PREPARATION: B-8. TAKEN SIMULTANEOUSLY WITH B-12, B-13

In the second year the principles underlying the subjects of Steam Engineering, Hydraulics and Thermodynamics are demonstrated in a practical manner in the work in the Engineering Laboratory. Greater importance is attached to the development of initiative and responsibility in the student than the mere accomplishment of a large number of carefully planned tests. The character of this work is indicated by the following list of experiments and tests:

Calibration of gages, thermometers, indicators, anemometers, tachometers, and other measuring instruments.

Experiments on flow of steam.
 Calorimeter tests.
 Radiation tests and pipe covering tests.
 Injector and ejector tests.
 Engine tests. Condensing and non-condensing.
 Steam pump tests.
 Surface condenser tests.
 Valve setting.
 Boiler testing.
 Tests on heating and ventilating fans, both motor and engine driven.
 Pump tests. Triplex and centrifugal.
 Air compressor tests.
 Flue gas analysis.
 Steam turbine tests. Condensing, non-condensing and low pressure.

[COURSE VI]

Machine Shop Practice—B-18

PREPARATION: B-5, B-9

Throughout the second and third years systematic instruction is given in the most approved methods of machine shop practice, the object being to familiarize the student with the proper use of hand and machine tools and the characteristics of the different materials worked. Arrangements have been made with a local machine company of such a character as to give the work the greatest educational value and the important commercial element which stimulates the student's interest. Particular attention is given to the form, setting, grinding and tempering of tools and the mechanism of the different machines involving certain speeds, feeds, etc. The course is so planned that the instruction in each typical operation shall conform as nearly as possible to commercial machine shop practice on textile machinery. The list of tools given elsewhere in this bulletin gives an idea of the scope of the work which includes chipping and filing, tool grinding and tempering, straight and taper turning, screw cutting, drilling and boring, planer work, milling machine work, including gear cutting. Instruction is also given in the use of wood working tools, both hand and machine and also in forging.

[COURSE VI]

Mill Engineering—B-19

PREPARATION: B-II, B-16

This course consists of ninety lectures and one hundred and forty-two hours of drawing-room exercises, and is taken by all students in the Textile Engineering Course during the third year. This work covers a wide range of subjects and is of the most practical character possible. All of the student's previous work in engineering and his knowledge of

the textile processes are here brought together in the consideration of the larger problems of mill design, construction and "organization." A detailed study is made of the most modern types of mill buildings including all calculations and drawings. Practice is also given with the engineer's transit and level in plane surveying, setting batters, lining and leveling shafting, etc.

The modern methods of power transmission and the proper arrangement of textile machinery are also given careful consideration. The problems are in every case taken from actual conditions from mills already built or in process of construction. The questions of mill heating, ventilation, lighting, humidification and fire protection are also studied and the time spent in the drawing-room enables the student to work out nearly all of the more important problems involved in the design of an entire textile mill plant. The close relation existing between proper plant design and economical production is also considered.

[COURSE VI]

Mill Engineering—B-20

PREPARATION: B-11, B-16

This course, consisting of forty-five lectures and thirty hours of drawing-room exercises, covers in a more general study the subjects outlined in B-19. Emphasis is laid on the principles involved in the planning of a manufacturing plant with the view of familiarizing the student with the general methods employed to obtain efficient results.

[COURSES I-II-III]

Power Plants—B-21

PREPARATION: B-13

This course consists of fifteen lectures in the second term of the third year and takes up the fundamental considerations involved in the planning of a power plant for a textile mill. A standard text book is used in connection with the lectures and the problems are taken largely from plans of existing modern plants. The choice of type and size of units for given conditions are given particular attention.

[COURSE VI]

Engineering Laboratory—B-22

PREPARATION: B-17

In the third year laboratory work is given as follows:

Complete steam plant testing with costs.

Gas engine tests with costs.

Steam requirements of textile processes and machines, such as dyeing, bleaching, drying, scouring, etc.

Opportunity is offered in the various departments and power plant for a large variety of experimental work of a practical character.

[COURSE VI]

Physical Laboratory—B-23

PREPARATION: B-12

Laboratory work is given during the second and third years to familiarize the student with physical measurements and to exemplify the principles set forth in the lectures in Physics. Reports are prepared from each experiment giving the object of the experiment, method of procedure, observations and conclusions, in order that the student may acquire practice and understand the interpretation of data.

[COURSE VI]

Physics (Elementary Electricity)—B-24

PREPARATION: B-12

This course consists of forty-five lectures and recitations and is held during the second term of the second year. It is designed to give a general knowledge of the theory and principles involved in the Generation Transmission, and Utilization of Direct Current Electricity with a view to their application to the textile industry. The lectures deal essentially with Magnetism, Electrical Units, Measuring Instruments, Elementary principles underlying the design of Direct Current Machinery, Generators, Motors, Switchboard Design, Transmission of Energy, Illumination, Storage Batteries, Electrolysis, etc. A standard text-book is used to furnish descriptive matter on construction details, accessories, etc.

[ALL COURSES]

Electrical Laboratory—B-25

PREPARATION: B-24. TAKEN SIMULTANEOUSLY

Second year students in the Textile Engineering Course are required to take laboratory work in conjunction with the lectures with the view to familiarization with instruments, methods of testing electrical machines and apparatus.

[COURSE VI]

Advanced Electricity—B-26

PREPARATION: B-24

This course is taken in the third year and relates almost entirely to the study of Alternating Current Phenomena. The lectures treat of the Generation, Transmission, and Application of Alternating Currents, and offer a means of comparison between this and the Direct Current System.

Much attention is given to the Motor Drive and its application to the textile industry and the general considerations necessary for the equipment of a textile plant. The question of Illumination of textile mills has become very important and offers a large field for study, as the conditions involved are of a great variety and are characteristic of this industry alone.

[COURSES I-II-III-VI]

Electrical Laboratory—B-27

PREPARATION: B-26

In addition to the lecture course third year students in the Textile Engineering Course are required to take laboratory work which is devoted to the study of Alternating Current Instruments, Machinery, Methods of testing, etc.

[COURSE VI]

CHEMISTRY AND DYEING DEPARTMENT—C

Elementary Chemistry (Inorganic and Organic Chemistry)—C-1

Instruction in Elementary Chemistry extends through the first year and includes lectures, recitations, and a large amount of individual laboratory work upon the following subjects:

Inorganic Chemistry

Chemical Philosophy

Chemical action, chemical combination, combining weights, atomic weights, chemical equations, acids, bases, salts, Avogadro's law, molecular weights, formulas, valence, periodic law, etc.

Non-Metallic Elements

Study of their occurrence, properties, preparation, chemical compounds, etc.

Metallic Elements

Study of their occurrence, properties, metallurgy, chemical compounds, etc.

The students take up as thoroughly as the time will permit, the qualitative detection of the more common metals and non-metals, with practical work.

Organic Chemistry

The Hydrocarbons and their Derivatives

Study of their occurrence, properties, preparations, uses, etc. This work although elementary in character is of sufficient breadth to prepare the student understandingly for the work with the artificial dyestuffs which follows.

[ALL COURSES]

Qualitative Analysis—C-2

PREPARATION: C-1 TAKEN SIMULTANEOUSLY

Qualitative Analysis is studied during the second term of the first year. The work is based upon Prescott and Johnson's Qualitative Chemical Analysis and consists of one lecture, one recitation, and not less than twelve hours laboratory work per week. The student must become familiar with the separations and the detections of the common metals and acids by the analysis of a satisfactory number of solutions, salts, alloys, pigments, etc. At intervals during the term, short laboratory tests are given as well as the regular written examinations.

No pains are spared to make the course as valuable to the student as possible and to encourage only thorough and intelligent work.

When sufficiently advanced, students take up the examination of various products with which the textile chemist must be familiar, such as testing mordanted cloths, pigments, and the various dyeing reagents.

During the latter part of this course a certain amount of time is devoted to the preliminary operations of Quantitative Analysis, such as the precipitation and washing of such substances as barium sulphate, magnesium ammonium phosphate, calcium oxalate, etc., although no weighings or actual determinations are made.

A student's marks in this subject depend as much upon the neatness and care used in manipulation as upon the actual results obtained.

[COURSE IV]

Stoichiometry—C-3

PREPARATION: B-I

This subject is taken during the second half of the first year.

The application of the metric system is thoroughly studied, and problems are worked involving the expansion and contraction of gases, determination of empirical formulae, combining volume of gases, quantitative analysis, etc.

[COURSE IV]

Advanced Inorganic Chemistry—C-4

PREPARATION: C-I

The whole subject of Inorganic Chemistry is reviewed during the second year, and many advanced topics are introduced which were necessarily omitted from the first year course in General Chemistry.

[COURSE IV]

Advanced Organic Chemistry—C-5

PREPARATION: C-I

The course consists of lectures and recitations extending through the second year. The principles of organic substitution and synthesis are thoroughly discussed using as many illustrations as the time will permit, particularly such as are applied in the arts. The alliphatic series of hydrocarbons and their derivatives are studied for about twenty weeks of the year, the remainder of the time being devoted to the benzene series. The aim of the course is to lay a broad foundation for the chemistry of the artificial dyestuffs, which is studied in the third year. Students are required to work out problems in the synthesis of various compounds in order to get familiarized with equation writing.

[COURSE IV]

Quantitative Analysis—C-6

PREPARATION: C-2, C-3

During the second year, the principles of analytical work are thoroughly taught, the work being based on Talbot's Quantitative Chemical Analysis, Gravimetric analysis is studied during the first term, and volumetric analysis during the second term. The samples analyzed include salts, ores, minerals, bleaching powder and alkalies. Frequent recitations are held for the discussion of methods and the solution of stoichiometrical problems. Students are encouraged to read the standard works and magazines on chemical subjects, in order to cultivate broad views of the science.

[COURSE IV]

Quantitative Analysis—C-7

PREPARATION: C-6

The third year work involves chiefly technical analysis, the principal consideration being the analysis of water, alum, ammonia, soaps, coal, indigo, tannin, and the ultimate analysis of organic compounds, as well as the examination of acids, alkalies, oils, scouring materials and such substances as starches, gums, and other thickeners, detection of adulterants, etc.

No pains are spared to give the student the benefits of all the latest researches along the lines of industrial analytical methods, and original work is encouraged in all.

[COURSE IV]

Physical Chemistry—C-8

PREPARATION: C-4, C-5, B-12

This subject is studied during the third year.

It includes the principles of calorimetry, specific heat, vapor density, the various methods of determining molecular weights, laws of solutions, electrolytic dissociation, theories of precipitation, thermo-chemistry, surface tension, etc. The student is required to work out a large number of problems introduced by the subject.

[COURSE IV]

Textile Chemistry and Dyeing—C-9

PREPARATION: C-1, B-5, B-9, B-10

The outline of the lecture course which is given through the second year is as follows:

Technology of Vegetable Fibres

Cotton, Linen, Jute, Hemp, China Grass, etc. Chemical and physical properties, chemical composition, microscopical study, and their action with chemicals, acids, alkalies, heat, etc.

Technology of Animal Fibres

Wool, Mohair, Silk, etc. Chemical and physical properties, chemical composition, microscopical study, and their action with chemicals, acids, alkalies, heat, etc.

Technology of Artificial Fibres

Study of the various forms of artificial silk, the process of manufacture, their properties and action with chemicals, acids, heat, etc.

Operations Preliminary to Dyeing

Bleaching of cotton and linen, wool scouring, bleaching, fulling and felting of wool, carbonizing, silk scouring and bleaching, action of soap.

The bleaching of cotton cloth, yarn and raw stock is studied at length with detailed descriptions of the various forms of kiers and machinery used; also the action of the chemicals used upon the material and the various precautions that must be taken in order to insure successful work.

Under this heading is also included an exhaustive study of the reagents used in emulsive wool scouring process and their action upon the fibre under various conditions; also the most successful of the solvent methods for degreasing wool.

Water and its Application in the Textile Industry

Impurities present, methods for detection, their effect during the different operations of bleaching, scouring, dyeing and printing, and the methods for their removal or correction.

The important subject of boiler waters is also studied under this heading with a full discussion of the formation of boiler scale, its disastrous results and the methods by which it may be prevented.

Mordants and Other Chemical Compounds used in Textile Coloring not Classified as Dyestuffs

Theory of mordants, their chemical properties and their application, aluminum mordants, iron mordants, tin mordants, chromium mordants, organic mordants, tannin materials, soluble oil, fixing agents, levelling agents, assistants, and numerous other compounds not dyestuffs that are extensively used in the textile industry.

Under the heading is included the definitions of various terms and classes of compounds, used by textile colorists, such as color lakes, pigments, fixing agents, developing agents, mordanting assistants, mordanting principles, levelling agents, etc.

Theory of Dyeing

A discussion of the chemical, mechanical, solution and absorption theories, and the various views that have been advanced by different investigators of the chemistry and physics of textile coloring processes.

Under this heading is discussed the general methods of classifying dyestuffs and definitions of such terms as textile coloring dyeing, textile printing, substantive and adjective dyestuffs, monogenetic and polygenetic dyestuffs, etc.

Natural Coloring Matters

Organic, properties, an application of indigo, logwood, catechu or cutch, Brazil wood, cochineal, fustic, tumeric, madder, quercitron bark, Persian berries, and other natural dyestuffs that have been used within recent years by textile colorists.

Mineral Coloring Matters

Under this heading are discussed the properties of such inorganic coloring matters and pigments as chrome yellow, orange and green, Prussian blue, manganese brown, iron buff, etc.

Artificial Coloring Matters

General discussion of their history, nature, source, methods of manufacture, methods of classification, and their application to all fibres.

Special study of:—

Basic Coloring Matters.

Phthalic Anhydride Colors, including the eosins, phloxines, etc.

Acid Dyestuffs.

Janus Colors.

Direct Cotton Colors.

Sulphur Colors.

Mordant Colors, including the alizarines and other artificial coloring matters requiring metallic mordants.

Mordant Acid-Colors.

Insoluble Azo Colors, developed on the fibre.

Reduction Vat Colors, including Artificial Indigo, Indanthrene, Flavanthrene, Viridanthrene and Melanthrene.

Aniline Black and other artificial dyestuffs not coming under the above heads.

As each class of dyestuffs is taken up, the details of the methods of applying them upon all the different classes of fabrics and in all the different forms of dyeing machines are thoroughly discussed; also the difficulties which may arise in their application, and the methods adopted for overcoming them.

Machinery used in Dyeing

A certain amount of time is devoted to the description of the machinery used in the various processes of textile coloring, which is supplemented as far as possible by the use of charts, diagrams, lantern slides, etc.

Most of the important types of dyeing machines are installed within the dyehouse of the School and the students can be taken directly from the lecture room and shown the machines in actual operation.

[ALL COURSES]

Dyeing Laboratory—C-10

PREPARATION: C-9 TAKEN SIMULTANEOUSLY

Besides lectures and recitations upon the subject of Textile Chemistry and Dyeing practical laboratory work is required. By the performance of careful and systematic experiments the student learns the nature of the various dyestuffs and mordants, their coloring properties, their action under various circumstances and the conditions under which they give the best results. The more representative dyestuffs of each class are applied to cotton, wool and silk, and each student is obliged to enter in an especially arranged sample book, a specimen of each of his dye trials with full particulars as to the conditions of experiment, percentage of compounds used, time, temperature of dye bath, etc.

For convenience and economy most of the dye trials are made upon small skeins or swatches of the required material, but from time to time students are required to dye larger quantities, in the full sized dyeing machines which are described elsewhere.

By the use of a small printing machine the principles of calico printing are illustrated, and by means of the full sized dyeing machines, vats, etc., the practical side of the subject is studied. It is the constant endeavor of those in charge, to impart such information of a theoretical and scientific character as will be of value in the operation of a dyehouse.

[COURSE IV]

Dyeing Laboratory—C-11

PREPARATION: C-9. TAKEN SIMULTANEOUSLY

This course in general laboratory work in Textile Chemistry and Dyeing is given during the second term of the second year. It is so arranged as to acquaint the student with the properties of the fibres, mordants, coloring matters, etc., and their application in the Textile Industry.

[COURSES I-II-III]

Industrial Chemistry Laboratory—C-12

PREPARATION: C-1

Special attention has been given to this subject because it is considered extremely important in the study of chemistry in general, and of textile chemistry in particular. During the second year considerable time is spent in the laboratory in the actual manufacture, from raw materials, of the chemical compounds used in textile work. Each student is required to make careful record of all of the crude materials used, as starting points, and to carry the various processes through as carefully as possible with the view of producing as great and pure a yield of each substance as possible. Industrial Chemistry not only involves the application of the principles of both inorganic and organic chemistry, but of analytical work as well, for the purity of the compounds produced must be tested after their manufacture.

In addition to the general work in this subject, each student is required to make a special study of the manufacture of some chemical from raw materials in considerable quantity (20 to 25 pounds) making a complete quantitative analysis of all the raw materials used and of the finished product, accounting for everything throughout the process with the object of producing as near the theoretical yield as possible. The student is charged with amount of raw material at market prices, and the finished product is bought back by the school.

Recently much new apparatus has been added to the industrial chemistry laboratory and it is now believed to be one of the most complete of its kind. The present equipment allows of a comparatively large quantity of materials being handled at one time.

[COURSE IV]

Lecture—C-13

PREPARATION: C-4, C-5, C-12

During the whole of the third year, lectures and recitations are held in Industrial Chemistry, the course in general following "Thorpe's Outline of Industrial Chemistry." Particular attention is paid to those subjects which are of special interest to the textile chemist, as oils, soaps, gas and coal tar industry, building materials and the manufacture on a large scale of important chemical compounds, such as the common acids and alkalies, bleaching powder, various mordants, etc. The course is illustrated as far as possible with specimens, diagrams and charts, and the students are given an opportunity to visit some of the industrial establishments in the vicinity of Lowell and Boston.

[COURSE IV]

Advanced Textile Chemistry and Dyeing—C-14

PREPARATION: C-9, C-10

This is a continuation of the Textile Chemistry and Dyeing of the second year and includes a review of the second year's work in this subject, with the introduction of many advanced considerations, and in addition the following subjects:—

Classification and Construction of Artificial Dyestuffs

A study from a more advanced standpoint of the classification and constitution of artificial dyestuffs, including the various methods used in their production, also the orientation of the various groups which are characteristic of these compounds, and their effect on the tinctorial power of dyestuffs.

The object of this study is to give the student a more complete knowledge of the artificial dyestuffs from the color manufacturer's point of view, and it will prove of particular value to those who intend later to enter the employ of dyestuff manufacturers or dealers.

This subject cannot be taken by students who have not completed the second year course in Organic Chemistry.

Color Matching and Color Combining

A study of that portion of physics which deals with color, and the many color phenomena of interest to the textile colorist, the lecture work being supplemented with the practical application of the spectroscope and tintometer, and much practice in the matching of dyed samples of textile material.

The primary colors both of the scientist and textile colorist and the results of combining colored lights and pigments, and such subjects as color perception, color contrast, purity of color, luminosity, hue, color blindness, dichroism, fluorescence, and the effect of different kinds upon dyed fabrics are discussed under this heading.

Each student's eyes are tested for color blindness early in the course in order that he may be given an opportunity to change his course if his eyes should prove defective enough to interfere with his work as a textile colorist.

A dark room has been provided where various experiments in color work and color matching may be performed.

Dye Testing

This subject includes the testing of several dyestuffs of each class, to all the common color destroying agencies, the determination of their characteristic properties and their action towards the different fibres. Also the determination of the actual money value and coloring power of dyestuffs in terms of a known standard.

Each student is required to make a record of each color tested upon an especially prepared card which furnishes a permanent record of the dyestuffs, its dyeing properties, fastness to light and weather, washing, soaping, fulling, perspiration, bleaching, steaming, ironing, rubbing, acids and alkalis.

Union Dyeing

A study of the principles involved in the dyeing of cotton and wool, cotton and silk, and silk and wool union materials with the production of solid and two color effects.

Textile Printing

A thorough study of the whole subject of textile printing, each student being required to individually produce no less than twenty different prints including the following styles:— Pigment style, direct printing style, steam style with tanning mordant, steam style with metallic mordant, madder or dyed style, the ingrain or developed azo style, discharge dyed style, discharge mordanted style, resist style, indigo printing, aniline black printing.

The different parts of the calico printing machine are thoroughly studied, the precautions which must be considered in its use and the arrangement of the dyeing apparatus which must accompany such a machine.

Special attention is paid to the methods of mixing and preparing the various color printing plates that are used in the above work upon the manufacturing scale as well as experimentally in the laboratory.

Cotton Finishing

A study of the various processes of finishing cotton cloth and the different materials used therein. The work involves the discussion of the various objects of cotton finishing and such operations as pasting, damping, calendering, stretching, stiffening and filling, and the various machines used for carrying out these processes.

Mill Visits

During the third year, visits are made to some of the large dyehouses, bleacheries and printworks in the vicinity.

[COURSE IV]

Dyeing Laboratory—C-15

PREPARATION: C-9, C-10

The laboratory work in Advanced Textile Chemistry and Dyeing is thorough and so arranged as to accompany and supplement the lecture work which has already been described.

[COURSE IV]

Engineering Chemistry—C-16

PREPARATION: C-4, C-5, C-6

During the second term of the third year a series of lectures are given upon the general subject of Engineering Chemistry, which include particularly the consideration of fuels, oils, and water from the chemical engineer's standpoint. The elements of Chemical Engineering are also considered to such an extent as time will permit.

[COURSE IV]

Industrial Analysis—C-17

PREPARATION: C-6

In conjunction with the lectures in Engineering Chemistry there is required a specified amount of laboratory work in the Industrial Analysis Laboratory which has been recently thoroughly equipped with the latest and best apparatus for fuel and oil analysis.

[COURSE IV]

Microscopy—C-18

The value of the microscope in the detection and examination of the various fibres cannot be over-estimated, and often facts may be discovered, and conclusions drawn, which could be arrived at in no other way.

The students in this course are given as much work with the microscope as time will permit. They receive instruction in the use of the high grade microscopes, and not only have practice in the examination and detection of the fibers, but are required to become proficient in the preparation of permanent slides.

Opportunity is also given for students to take photomicrographs of fibers and the various slides which they may prepare. A special dark room has been provided for this purpose.

[COURSE IV]

Thesis—C-19

Before graduation the student must present a thesis which shall consist of a report of some original investigation or research that he has conducted while at the school.

A certain number of hours are specially set aside for this work during the third year and students are encouraged to select some subject for their investigation which shall be of practical as well as theoretical interest. For details of preparation of thesis see page 85.

[COURSE IV]

TEXTILE DESIGN AND POWER WEAVING DEPARTMENT—D

Textile Design—D-1

During the first year instruction is given in the subjects of Classification of fabrics, use of point or design paper, plain fabrics, intersection, twills and their derivation, sateen, basket and rib weaves, checks and stripes, fancy weaves including figured and colored effects; producing chain and draw from design and vice versa; extending and extracting weaves.

[FIRST TERM—ALL COURSES]

[SECOND TERM—COURSES I-II-III-VI]

Decorative Art —D-1

The instruction in this subject is given in connection with Textile Design, and is conducted entirely by class work. During the first term, Freehand Drawing is taught by means of plates and models, and practice in coloring is given in conjunction with this work.

Practice in lettering, spacing and general arrangement of designs and sketches is given. The Engineering alphabet is used in all work.

The work of the second term is given definite direction, as the drawing, sketching, coloring and designing have reference to their application in textiles. Good examples of applied design in textiles as well as in other branches are used as a basis for modified designs selected and composed by the student. This stimulates originality as well as teaches the student to appreciate good designs and color.

Cloth Analysis—D-1

In the first year this subject takes up in a systematic manner the analysis of samples illustrating the various cloth constructions for the purpose of determining the design of the weave, the amount and kind of yarns used and forms the basis of calculation in the cost of reproducing any style of goods. The various headings discussed are, Reeds and Setts, Relation and determination of counts of cotton, woolen, worsted, silk, and yarns made from the great variety of vegetable fibers. Grading of yarns, folded, ply, novelty and fancy yarns. Application of the metric system to yarn calculation. Problems involving take-up, average counts, determination of counts of yarn, weight of yarn required to produce a given fabric.

[ALL COURSES]

Hand Loom Weaving—D-1

During the first year the work in hand loom weaving is taken in connection with design and analysis and consists largely of picking-out patterns and reproducing them in the loom. Instruction is also given in hand dressing, combing, beaming, drawing-in and building harness chains for dobby work.

[FIRST TERM—ALL COURSES]
[SECOND TERM—COURSES I-II-III]

Textile Design—D-2

FOR COTTON GOODS—PREPARATION: D-1

The work of the second year follows with consideration of fancy and reverse twills, diaper work, damasks, skip weaves, sateen fabrics with plain ground, backed fabrics, and multiple ply fabrics. Students are required to make original designs and put the same into the loom. Special attention is given to the consideration of color effects.

The analysis of these fabrics forms a part of the course in design. This also includes the necessary calculations required to reproduce the fabric or to construct fabrics of similar character.

[COURSES I-III]

Textile Design—D-3

FOR WOOLEN AND WORSTED GOODS

PREPARATION: D—I

Warp and filling backed cloths, figured effects produced by extra warp and filling, double cloths, multiple ply fabrics, cotton warps, blankets, bath-ropes, crepes, filling reversibles, Bedford cords, imitation furs, crepons, matelasse and imitations, double plain, ingrains, velvets, cord-uroys, overcoatings, trouserings.

The analysis of these fabrics together with the consideration of the shrinkages, and dead loss in all fabrics, theory of diameter of yarns, costs of mixer and blends, are a part of this course.

[COURSES II-III]

Decorative Art—D-4

PREPARATION: D-I

The work of the second year is similar to that of the previous year, but is more advanced and specific. More original work is required as well as copying and composition work.

[COURSE III]

Hand Loom Weaving—D-5

PREPARATION: D-I

In the second year, blanket, Jacquard and leno work are covered, and experiments are made with different weaves and fabrics.

[COURSE III]

Textile Design—D-6

PREPARATION: D-2 OR D-3

The advanced work of the third year takes up the more complicated weaves adapted to harness work and leads into leno and Jacquard designs. The following is a brief list of the subject heads which will give some idea of the course: Double plain cloths, Ingrains, Tricots, Chinchilla, Tapestry, Blankets, Upholsteries, Spot weaves, Pile or Plush, Crepon, Matelasse and its imitation, Pique, Marseilles, Quilting, Miscellaneous designs for Jacquard, Lenos, Fustain, Tissue fabrics, Lappets, etc.

The same plan is pursued during this year as in the second year, that of requiring the students to make original designs and to weave the same.

[COURSES I-II-III]

Cloth Construction—D-7

PREPARATION: D-2 OR D-3

The work includes the application of the different weaves and their combinations in the production of fancy designs, both modified and original, the calculations involved in the reproduction of standard fabrics changed to meet varying conditions of weight, stock, counts of yarn and value, and the discussion of the breaking strengths of fabrics and relationship of the construction of the fabric to breaking strength.

Instruction in this subject is given by class room work and is intended to bring together the principles considered under the subjects of design, cloth construction, weaving and yarn making of previous years, and shows the bearing each has in the successful construction of a fabric.

[COURSES I-II-III]

Textile Costs —D-7

A course of lectures and class work are given for the purpose of giving instruction upon the systems of determining the costs of producing textile yarns and fabrics, as well as the value of the materials at various stages in the process of manufacture. It is not the plan of this course to teach one particular system of cost finding to the exclusion of all others but rather to give the general fundamental principles applicable in any system, to show the interrelationship of the various departments and the duties of the various officers. The list of the headings under which the instruction is given will give some idea of the ground covered.

Requirements in a cost system.

Comparison of new and old methods.

Organization of a mill and the relationship of the departments.

Administrative, Manufacturing, Commercial Division.
Distribution of expenses.
Depreciation.
Labor and its subdivisions: Day work—Piece work, etc. Premium labor, Differential labor.
Details in processes in manufacturing influencing costs.
Inventories.
Numbering or lettering processes applied to cost systems.
Material tables.
Time cards.
Weekly Department cards.
Use of charts in showing comparison of costs.
Wastes, leaks.
Problems are frequently given for the purpose of illustration and to assist in fixing the principles involved clearly in mind.

[COURSES I-II-III]

Decorative Art—D-8

PREPARATION: D-4

Original designs and sketches for particular grades of goods and the study of color effects form the important part of the third year course. It should be understood that work in Decorative Art is carried on in conjunction with textile construction and weaving, particularly on the Jacquard loom. Designs of merit are carefully developed in detail and woven into cloth.

[COURSE III]

Decorative Art for Special Students

This course is planned to give a student a working knowledge and appreciation of design. The first and second years are devoted to a general study of design, color, perspective, lettering and rendering. Drawings are made in the Historic styles for all materials—wood, gold, silver, copper, brass, leather, fabrics, wall papers, and glass.

In the third year students should specialize and devote their attention to the material in which they expect to work.

Power Weaving—D-9

PREPARATION: D-I. TAKEN SIMULTANEOUSLY WITH B-7

In connection with the work in Textile Design and Cloth Analysis practical work is carried on upon the power looms during the second year. This includes the preparation of warps, beaming, dressing, sizing, drawing-in and making of chains, the cutting and lacing of cards.

Spooling and quilling and the machinery for the same. A study is made of warpers, sizing machines both for cotton and woolen. Lectures are given properly timed to correspond with the progress of the student in the Power Weaving laboratory covering the following subjects:

Loom adjustments, chain building, shuttle changing looms, dobby looms, single and double acting dobbies, handkerchief motions, leno weaving, centre selvage motions, filling changing looms, oscillating reeds, lappet motions, various shaker motions, towel and other pile cloth weaving, Jacquard looms, single and double lift leno Jacquards, Jacquards of special design, tying up Jacquard harness. The consideration of the mechanical operation and design of the special mechanisms and the calculations involved is taken up by the Engineering Department in the course of weaving mechanism.

[FIRST TERM—ALL COURSES]

[SECOND TERM—COURSES I-II-III-VI]

Power Weaving—D-10

PREPARATION: D-9—D-2 OR D-3

In the third year instruction is given in weaving on fancy woolen and worsted looms, single and double acting dobbys, leno weaving, various shaker motions, lappet loom weaving, double and single lift Jacquard looms, tying up Jacquard harness, leno Jacquard, harness and box chain building; warp preparation for woolen and worsted and cotton, formulas for making up different kinds of sizing. Lectures are given to correspond with the same.

[FIRST TERM—COURSES I-II-III-VI]

[SECOND TERM—COURSES I-II-III]

LANGUAGES AND HISTORY—E

English—E-1

PREPARATION: A-4

A technically trained man should be able to express himself clearly, forcibly and fluently, as inability to do so will be a serious handicap to him in after life. The object of the English course is to develop the student's power of expression by a thorough study of the principles of advanced rhetoric and composition and by constant writing of themes illustrative of the four forms of discourse, viz. description, narration, exposition, and argumentation. In addition to the study of rhetoric and composition and the writing of themes, several classics such as are not read in the preparatory schools are studied and discussed.

[ALL COURSES]

Elementary German—E-2

PREPARATION: A-5

This course is intended for first year students. The first half year is devoted to the study of the rudiments of German grammar, with practice in composition. The work of the second half year consists of the translation of ordinary modern German prose, with frequent practice in reading at sight works along scientific and industrial lines.

[COURSES I-II-IV-VI]

Advanced German—E-3

PREPARATION: A-5

The course is intended for those students having an elementary knowledge of the language who wish to become proficient in translating scientific and commercial German. The work of the first half year consists of the reading of scientific German dealing with a variety of subjects. The second half year is devoted to the translation of commercial German with practice in commercial correspondence.

[COURSES I-II-IV-VI]

French—E-4

PREPARATION: A-6

The course is designed for students with an elementary knowledge of the language who desire practice in translating scientific and commercial French, together with a review of the elements of grammar and work in composition.

[COURSE III]

Industrial History—E-5

PREPARATIONS A-7

The economic history of a nation is not less interesting or dramatic than its political history, while it is absolutely essential to a thorough understanding of modern business conditions. The object of this course, which is intended for second year students, is to trace the development of the three leading industrial nations of the world, viz. the United States, England, and Germany, from simple, isolated agricultural communities to the complex industrial and commercial society of today. The course consists of weekly lectures supplemented by text-book reading. Among the topics treated are: natural resources; colonization; territorial expansion; manufactures; agriculture; finance; commerce; transportation; revenue tariffs, monopolies; governmental regulation; organization of labor; industrial legislation; immigration, conservation; contemporary problems. During the year each student will be required to write two or more theses on subjects connected with industrial history, in order that he may have practice in research work and also may continue his training in English.

[ALL COURSES]

COTTON DEPARTMENT—F

Cotton Yarns (Cotton Carding, Drawing and Spinning)—F-1

PREPARATION: B-5, B-1 OR 2, B-9, B-10

Instruction in these subjects is given by means of lecture and laboratory work during the second term of the first year and the first term of the second year.

The outline of the course is as follows:

Cotton Fiber

Development of Cotton Spinning Machinery.

Botanical Varieties—Their Classification and Characteristics.

Commercial Varieties—Classifications, Characteristics and Adaptatives.

Microscopical Examination of Various Cottons.

Points Considered in Judging Cotton—Dampness, Color, Uniformity, etc.

Grading and Stapling—American, Egyptian and Sea Island Cottons.

Methods of Cultivation and Marketing.

Ginning—Construction, Operation and Advantages of Saw and Roller Gins.

Baling—Various forms of Baling Presses and their Products, Characteristics of each.

Mixing—Object and Methods of Mixing for Per cent., Grade, Variety and Color Mixtures.

Classification of the Processes of the Yarn Manufacture.

Opening and Picking

Construction and Operation of various machines used in opening and picking cotton, Hopper Bale Breaker, Opener, Automatic Feeder, Breaker, Intermediate and Finisher Pickers, Waste Openers and Cleaning Machines.

Details of Construction—Cleaning Trunks, Evener Motions, Types of Beaters, Grids and Screens, Lap Measuring Motion, Safety Stop Motion.

Details of Operation—Regulation of the Air Current, Character and Regulation of the Waste, Drafts of Intermediate and Finisher.

Adjustment of Feeder, Grid Bars, Lap Racks and Feed Rolls.

Causes of and Remedies for—Uneven laps, Split laps, Ragged selvages, Dirty laps, etc.

Cleaning and Oiling.

Carding

- Object and Principles of Carding.
- Construction and Operation of Revolving Flat, Wellman, Foss & Peevey and Roller and Clearer Cards.
- Details of Construction—Feed Plate and Rolls, Screens, Flats, Doffer, Combs, Coiler, Mote-knife, etc.
- Card Clothing—Various forms of Foundation, Wire, Method of setting, Number of Points per square foot, Shape and Size of Wire, Methods of Grinding, Method of Cutting Tape and Clothing Cylinder, Doffer and Flats.
- Details of Operation—Method of driving various parts, Stripping, Grinding and Burnishing, Setting of various parts, Draft, Speeds and Production, Temperature and Humidity.
- Care of Carding Machinery, defects in quality of work and remedies for same.
- Character and Regulation of waste.
- Sample Carding by hand of at least twelve different blends.

Drawing

- Theory of Drawing.
- Effect of the Doublings.
- Construction and Operation of the Drawing Frame.
- Details of Stop Motions, Mechanical and Electrical and advantages of each.
- Details of Drawing Rolls, Solid and Shell, Common and Metallic.
- Metallic Rolls—Construction, Operation and Advantages.
- Roll Covering—Materials used, Roller Cloth, Selection of leather for various kinds of work, methods of applying leather covering.
- Roller Varnish—Its object and methods of applying, recipes for same.
- Roll weighting for Common and Metallic Rolls.
- Setting of Drawing Rolls for Long and Short Staple, Heavy and Light Slivers, etc.
- Minor Details—Clearers, Traverse Motion, Weight Relieving Motion, Trumpets and Condensing.
- Amount and proportioning of drafts and tension.
- Construction and Operation of Railway Head.
- Details of Evener Motion, Stop Motions, etc.
- Care of Drawing Machinery, Roller Scouring, Cleansing and Oiling, Sizing of sliver, cut sliver and remedies for same.

Roving Processes

- Reeling, Weighing and Numbering of Roving by English and Metric Systems.
- The Development of the Fly Frame.
- Details of Construction of Slubber, Intermediate, Fine and Jack Fly Frames.

Details of the regulation of Draft, Twist, Lay and Tension on fly frames.

Amount of Twist for various cottons and methods of obtaining same.

Builder Motions—English and American types and method of setting and adjusting.

Proportioning and amounts of draft and roller setting.

Creeling, Piercing, Doffing, Cleaning and Oiling.

Stop Motions—Full bobbin. Safety stop, Back Stop motion, Single Roving Stop Motion.

Details of Winding and Regulation of the Tension.

Study of the Differential Motion and its work in the Fly Frame.

Study of the Functions and Development of the Fly Frame Cones.

Defects in adjustment and product of roving machinery and remedies for same.

Ring Spinning and Twisting

Theory of Spinning.

Classification of yarns in regard to uses, Materials, varieties and Twist.

Reeling, Weighing and Numbering of single and ply yarns.

Construction and Operation of the Ring Frame.

Consideration of Spinning details, thread guides, separators, traveller cleaners, warp and filling bobbins, space of spindles, drum and bands, roving traverse, etc.

Rolls and roll setting, weighting, single and double boss, amount and proportioning of draft for various yarns.

Twist and twist gearing, Amounts for warp, filling and hosiery yarns, ply yarns, etc.

Rings and Travellers, Kinds and methods of determining correct size for various yarns.

Comparison of Single and Double Roving in Spinning.

A Study of the development of the modern Spindle.

The Spinning Builder—Study of the Warp Filling and Combination Builder Mechanisms.

Calculations for Speed, Draft, Twist, etc.

Methods of preparing yarn for Twisting.

The Spooler and Multiple Winder.

Operation of Ring and Flyer Twisters.

A Study of the Wet and Dry Twisting Processes.

Care of the rolls, spindles, bands, doffing.

Uneven, cut and cockled yarns and remedies for same.

[COURSES I-III-VI]

Cotton Spinning—F-2

PREPARATION : F-1

The subject of Mule Spinning is taken during the second term of the second year and includes the following:

A Comparison of Throstle, Ring and Mule Spinning and the Products of each machine.

Advantages and Disadvantages of each machine.

Construction and Operation of the Self Acting Mule.

Details of Operation, Drawing and Twisting, Backing off, Winding, Re-engaging.

Details of Construction, Builder Motion, Quadrant, Roller Motion, Nosing Motions, Jacking Motions, etc.

A Study of Building and Winding.

Calculation of Draft, Twist, Drag, Production.

Causes of and remedies for, Kinky yarn, Soft cops, Ridgy cops, Uneven chase, etc.

[COURSE I]

Cotton Yarn Manufacture—F-3

PREPARATION : F-2

The third year work in Cotton Yarn Manufacture consists of the following:

Combing

Object of combing.

Kinds of cotton combed and class of goods requiring combed yarns. Preparing cotton for Combing, Drawing frame, Sliver lapper, Ribbon Machine.

Combinations of preparatory machines and details of operation.

A study of the Heilmann Comber and its operation, Feed Motion, Nippers, Cylinders, Detaching Mechanisms, Draw-box, Draft, Waste and Production, Single and Double Nip Machines.

Setting and Timing the Comber, Regulation of Waste and Production, Weight of lap, etc.

A Study of the Alsation Comber and its Operation.

A Study of the Nasmith Comber and its Operation.

Care and management of combing Machinery.

Organization

Methods of handling Cotton Waste, Details of the manufacture of Cotton Wadding and other Waste Products.

Details of Fine Yarn Spinning, the manufacture of Sewing Thread, Lace Yarns, Twines and Cords.

The Manufacture of Fancy Yarns, Nub, Soop, Splash, Spiral Yarns, Flake Yarns, etc.

Factory Organization for various sizes and styles of yarns, Equipment,
Programs, Balance of Production, Cost of Machinery, Power, etc.
The Economic Arrangement of Cotton Machinery.
Life of Cotton Machinery, Depreciation and Valuations.
Factory Cost Systems, Inventory, Productive and Non-Productive
Labor, Supplies, Maintenance, General Expenses, etc.

[COURSE I]

Knitting—F-4

PREPARATION: F-1 OR G-2

The course in Knitting is designed to meet the needs of those requiring special work in this branch, as well as those desiring only a general knowledge of the subject and is taken in the third year. The course begins with lectures upon the yarns used and the preliminary operations, and continues with the construction and operation of the various makes of knitting machines as applied to circular and flat knitting.

Beginning with the hand stocking frame, the student is given instruction upon the machines used for hosiery and the flat machines used in the manufacture of gloves, sweaters and jackets.

Following is a list of subjects taken up:

Knitting yarns and their Manufacture.

Operations preliminary to Knitting.

Winding—Cone Winding, The Payne Winder.

Development of Knitting.

Knitting Needles—Their Construction and Operation.

Latch Needles, Spring Needles.

Method of Producing Standard Stitches.

Study of the Plain, Rib and Tuck Stitches and their uses.

Circular and Flat Knitting Machines.

Operations involved in the Manufacture of Seamless Hosiery.

Study of the production of the Rib Top.

Details of Construction and Operation of the Circular Rib Knitting Machine, including a consideration of Stop Motions, Needle Cams, Pattern Wheels, Splicing Attachments, Measuring Devices, etc.

Transferring of Rib Tops.

Details of Construction and Operation of the Seamless Hosiery machine, including a study of Stop Motions, Plating Attachments, Pattern Wheels and Chains, Shaping the Heel and Toe, Reinforcing the Heel and Toe, Loosening the Stitch for Reinforcing and Shaping, Semi, Three-quarter and Full Automatic Hosiery Machines.

Construction of the Looper and Study of its Operation. Regulation of Tension, etc.

Designing on Seamless Hosiery Machines—Study of the Production of Fancy Stitches, Designing by means of Colored Threads.
 Size of Yarn for Various Work and Gauges.
 Study of the Finishing of Hosiery—Washing, Dyeing, Boarding, Mending, Pressing, Pairing, Stamping, etc.
 Imperfections in Circular Knit Goods and Remedies for Same—Dropped Stitches, Curled Work, Ragged Edges, Stains, Streaked Work, etc.
 A Study of the Flat Knitting Machines—The Lamb Principle as applied to Glove and Sweater Manufacture.
 The Jacquard as applied to Flat Knitting Machinery.
 Details of Construction and Operation of Circular Spring Needle Machine—including stitch regulation, adjustment of feeds, take up, etc.
 Tuck Designing on Spring Needle Circular Machines with illustrations.
 Efficiency of Underwear Machines, Production, in yards, pounds and garments.
 Method of Manufacturing Sweaters, Vests, Scarfs, Mufflers, Caps, etc.
 Method of Manufacturing of Underwear, Union Suits and Two Piece Goods.

[COURSES I-II]

WOOLEN AND WORSTED DEPARTMENT—G

Fibers; Wool Sorting, Scouring, Carbonizing—G-1

PREPARATION: G-2

These subjects are taken by students in the Course in Wool Manufacturing during the first term of the second year, and by students in the Textile Design and Textile Engineering Courses during the first term of the third year.

Instruction is given by means of lecture and laboratory work, the outline of which is as follows:

Rare Materials

- Animal Fibers—Wool, Silk, Mohair, Alpaca, Vicuna, Cashmere, Camel Hair, etc.
- Vegetable Fibers—Cotton, Flax, Hemp, Jute, Ramie.
- Wool Substitutes—Noil, Shoddy, Mungo, Extracts.
- Waste Products manufactured on Woollen Machinery—Cotton Waste, Linters, Flax, Hemp, and Jute Waste.
- Sources of supply and relative values of above.
- Chemical and Physical properties and Composition.
- Microscopical examination.

Wool Fiber

- Physical and chemical structure—Differences between wool, hair and fur—
- Physical properties, Strength, Elasticity, Curl, Lustre, etc.
- Felting Property—Hygroscopic Property.
- Structure and Cause of Kemps.
- Definitions of trade terms—Picklock, XXX, XX, 1-2 Blood, 3-8 Blood, 1-4 Blood, Delaine, Braid, etc.
- Pulled Wools—Their uses and Classification.

Wool Sorting

- Difference between Sorting and Grading—Sorting and Blending.
- Judging Spinning Qualities.
- Estimating Shrinkage
- Definitions of trade terms—Cots, Hog, Shurled Hogget, Wether, Fries, Paint, Stain, Shoulder, Cast, etc.

Wool Scouring

Object of Wool Scouring

Composition of Yolk and Suint.

Cholesterol and Lanolin.

Materials used as detergents.

Emulsion Process—Use of Soda, Potash, Hard and Soft Soaps.

Manufacture of Scouring Soaps with tests for impurities.

Water in Wool Scouring with tests for hardness, etc.

Effect of heat on Wool Fiber with proper heat of scouring liquor.

Recovery of potash salts and wool fat from waste scouring liquor.

The Solvent process—Degreasing Wool, with Naphtha.

Construction and use of Scouring Machines and Rinse Boxes with
Speeds, Adjustments and Productions.

Construction and use of Dryers, Table and Artificial.

Effect of heat on Lustre; proper heat for various classes of Wool—
(Braid, Botany, Mohair, etc.).

Carbonizing

Object of Carbonizing.

Carbonizing Wool, Noils, Burr Waste, Rags, etc.

Carbonizing Agents—Sulphuric Acid, Aluminum, Chloride, etc.

Hydrometers.

Strength of Carbonizing Agents.

Carbonizing with Acid Gases.

Neutralizing.

Burr Picking

Object of Burr Picking—What wools are Burr Picked, and why they
are not carbonized.

Construction and Use of the several Kinds of Burr Pickers.

Adjustments, Speeds and Production of same.

Mixing and Oiling

Object of Mixing. Laying down lots.

Mixing Different colors of Wool.

Mixing Wool with Cotton, Shoddy, Noils, etc.

Objects of Oiling—Discussion of Various Kinds of Oils used, Olive,
Lard, etc.

Oil Testing, Viscosity, Flashing Point, etc.

Manufacture of Emulsions.

Construction and Use of Automatic Oilers, Feeds and Pickers.

Speeds, Productions and Calculations for cost of Lots when materials
of different values are used.

[COURSES II-III-VI]

Woolen Yarns (Woolen Carding and Spinning)—G-2

PREPARATION: B-5, B-1 OR 2, B-9, B-10

This subject is taken by students in the Course in Wool Manufacturing during the second term of the first year and by students in the Textile Design and Textile Engineering Courses during the second term of the second year.

Instruction is given by means of lecture and laboratory work, the outline of which is as follows:

Carding

Principles of Carding.

Functions of various parts—Feed Rolls, Lickerins, Tumblers, Workers, Strippers, Cylinders, Fancies, Dickies, Doffers, etc.

Construction of various parts.

Direction of Revolution and Speeds.

Card Clothing—Construction and uses of the various Kinds of Backing: Leather, Flexifort, etc.—The several Kinds of Wire—Garrett, Metallic, Convex, Lickerin, etc.

The "Counts and Crown" method of counting Card Clothing.

Card Adjusting and the use of Card Sets.

Clothing the Card.

Card Grinding and Grinders, Solid Roll, Traverse, Screw and Chain.

Woolen Cards

Construction and use of the First Breaker, Second Breaker and Finisher.

Various methods of coupling Cards.

Card with Breast.

Woolen Card Feeds—Objects, Construction, and use of Automatic Feeds for First Breaker, Bramwell, etc.

The Construction and use of the several Kinds of Automatic Feeds for Second Breaker and Finisher, Apperly, Torrance Balling Head and Creel, Bates, Kemp, Scotch, etc.

Condensers, Rub Roll, Combination, Double Apron, etc.

Calculations for Proper Weight of Rovings, Speeds, Productions, etc.

SAMPLE CARDING.—Each student is required to make at least twenty Sample Mixes combining different colors and grades of Stock and to Felt and Mount the same. Part of the Carding to be done by Hand Cards and part on the Torrance Sample Mixing Card.

Woolen Mule

Principles of Spinning. History and development.

Hand Jack, Self-operating and Self-acting Mules. The Mule-head.

Methods of Driving the various parts, Rolls, Spindles, Carriages, etc.

Backing-off. Winding Mechanism.

Study of the Quadrant and Builder-rail. Regulation of the Fallers.

Double Spinning. Twisting on Mule and on Woolen Twister.

With the above lectures will be given all the necessary calculations and actual practice on the various machines.

[COURSES II-III-VI]

General Wool Yarn Manufacture—G-3

PREPARATION: G-1, G-2

In the second term of the second year and the entire third year instruction is given to students in the Course in Wool Manufacturing in General Wool Yarn Manufacture.

The following is an outline of the lecture and laboratory work given in the manufacture of Worsted Yarns.

Top Making

CARDING AND PREPARING—The principles of Worsted Carding—Types of Worsted Cards, Double Cylinder Lickerin, Breast, etc.

Speeds, Settings, Feeds, Adjustments, Productions.

PREPARING—Differences between Carding and Preparing—What Wools are Prepared and why they are not Carded. The use of Emulsions. A Set of Preparers. The calculations for Drafts on any Gill Box. The Clough Gill Box.

The proper Drafts in Preparing—Adjustments, Speeds, Productions, Calculations, etc.

GILLING AFTER CARDING—Number of Doublings, etc.

Combing

The principles, history and development of Worsted Combing.

Combing on the Noble and Lister machines.

Calculations for Draft—Settings, Speeds, Productions, etc.

Per cent. of noils.

GILLING AFTER COMBING—Proper Drafts and calculations for Doublings.

BACK WASHING—The object and nature of the process—Backwashing Liquors, Composition, Heat, etc.

The Hygroscopic property of Wool—Conditioning of Tops—Top Mixing.

Open Drawing or Bradford System

The Principles of Drawing. Numbers of Operations for different Counts of yarn. The use of Logarithms in Drawing Calculations, Study of the Drag—Calculations for Drafts and Twists—Proper Ratch.

The functions of the Weigh Box.

Measuring Stop Motions, Candle Stick, Side Knock-off, etc.

Calculations for length.

Construction and use of Gauge Points or Constants.

Effects of Doubling.

The Dram and Hank Systems for numbering Roving.

Cone Drawing

The object and use of Cone Drawing—Differential Motions, Builder Motions—Calculations for Draft—Twist—Tension and Lay—Adjustments, Speeds and Productions.

French Drawing

The principles and use of French Drawing—Functions of the Porcupine. The principles of Condensing—Manufacturing of Merino Yarns.

Spinning, Open or Bradford System

The Principles of Spinning. Calculations for Draft and Twist—Spinning on the Cap—Flyer and Ring Frames—The Scaife Builder Motion—Drag in Bradford System of Spinning—The use of Straight, Conical and Bell Mouthed Caps. Top Roll, Single and Double Covered, Iron and Wood.

Types of Frames, Leicester and Illingworth; Speeds, Productions, etc.

Spinning, French System

Principles of Worsted Mule Spinning, Calculations for Draft and Twist, Ratch, Drag, Backing off, Winding, Re-engaging, Size and shape of Caps, Builder Motion, Quadrant, Metric and English systems of Calculations.

Twisting

Principles of Twisting, Reeling, Weighing and Numbering of Single and Ply Yarns, Twisting on Cap, Flyer and Ring Frames—Calculations for Twist—Twist testing—Trap Twisters—Effect of direction of Twist; Speeds, Productions, Yarn Testing, etc.

The true difference between Woolen and Worsted Yarns. Layout of Machinery for different classes of Yarns—Power required for different machines—Cost of Machinery and approximate labor cost of each Department, Sorting, Scouring, Carbonizing, Picking, Carding, Combing, Drawing, Spinning, Twisting, etc., for various classes of Yarns, Carpet, Braid, Botany, etc.

General Wool Yarn Manufacture—G-4

PREPARATION: G-1, G-2

In the second term of the third year instruction in General Wool Yarn Manufacture is given to students in the Textile Design and Textile Engineering Courses. Students in these courses do not spend as much time in the Wool Department as do students in the course of Wool Manufacturing but the instruction given covers all the processes of Wool Yarn Manufacture.

FINISHING DEPARTMENT—H

Woolen and Worsted Fabrics—H-1

PREPARATION: C-1, D-1, D-9

The outline of this course which is given during the third year by means of lecture and laboratory work is as follows:

Burling and Mending

Under this head is taken up for consideration the examination of flannel as it comes from the loom, the construction, use, and location of the perch, the methods used in marking defects, measuring, weighing, and numbering of cloths, also the methods of inspection for fancies, single cloths, double cloths, etc. The object of burling, mending, and the types of tables employed, the method of removing knots, runners, etc., the object of back shearing and the use of burling irons, the replacing of missing threads and the importance of sewing as a part of the finishing process, are all considered in detail. The removal of oil and tar spots as well as stains of various kinds is studied.

Fulling

This branch covers a study of the condition of the flannel as it comes from the loom, the influence of oil, size, etc. upon the procedure. Considerable time is devoted to the various methods of producing a felt, the early types of stocks, hammer falling, crank stocks, etc., and their modifications and development into the present type of rotary fulling mills of both the single and double variety. The details of construction in all machines are carefully taken up and include the design and composition of the main rolls, methods of covering, regulation and means of adjusting the pressures of traps and rolls, consideration of the shoes, the use and regulation of the various types of stop motions, the different types of stretchers, guide rolls, and throat plates.

The theory of felt is taken up and the influence of pressure, moisture, heat, alkali, and acid is considered as well as the hydroscopic and felting properties of different wool fibres. The preparation of the flannel for the mill and the usual methods of determining shrinkages as well as the various methods of soaping obtain careful attention. The preparation of various fulling soaps and the value of each for the production of various degrees of felt as well as the determination of the proper amount of alkali for various goods are carefully studied and demonstrated. The manipulation of the various kinds of goods in the mill, viz: all wool, shoddies, and mixed goods is studied in class room and by operation in the mill.

The changes in weight and strength for each operation are carefully considered as well as the value of the flocks made in each. A study of the various methods of flocking, such as dry and wet are considered in both class and machine rooms. In each operation the defects likely to materialize are studied as well as the cause thereof, and various methods of modifying or lessening them.

Washing and Speck Dyeing

This branch considers the scouring, rinsing and washing of goods both before and after the fulling process. The various types of washers and the details of construction, such as suds, box, rolls, etc. The theory of scouring, uses of Fuller's earth, salt solutions, and sours, on the different kinds of goods is made clear by practical work in the machine room, where the defects due to improper scouring such as stains, cloudy effects, wrinkles, unclean goods, etc., are demonstrated. The discussion of the necessity of speck dyeing follows naturally from the study of these matters and includes methods of preparation, materials used, application and tests required.

Carbonizing

This is an important branch of finishing and includes a study of the various carbonizing agents, methods of application, strength of solutions, neutralizing, etc., as well as the machines used. Stains and imperfections resulting from carbonizing are also considered. The drying and tentering machines and extractors employed are taken up at this point.

Gigging, Napping and Steaming

The construction in detail of the various types of gigs, nappers, steamers, wet gigs, rolling, stretching, crabbing and singeing machines, is discussed and their actions upon the cloth and the results obtained are explained.

Various methods of obtaining lustre and the production of permanent finish are considered in connection with steaming and sponging.

Brushing, Shearing and Pressing

This includes as do the other branches a careful treatment of the machines employed, the preparation of the cloth for each process, the action of each machine in producing its part of the resultant effect. With the manipulation of the shear comes the matters of setting, grinding, and adjustment. With the brushing machine the effect of steaming and moisture upon the lustre and "feel" of the goods is shown. A study of the action of the presses both plate and rotary involves consideration of pressure, steaming, etc. Special processes to obtain particular effects are taken up and the part played by each machine is explained. The details involved in handling cloth on a commercial scale as for example measuring, weighing, ticketing, numbering, rolling, etc., are also explained. The necessary calculations and the methods of finishing all grades of goods are considered from time to time during the year.

[COURSES II-III-IV-VI]

Cotton Fabrics—H-2

PREPARATION : C-1, D-1, D-9

The outline of the course in the Finishing of Cotton Fabrics which is given during the third year is as follows:

Cloth Room

Inspection of the various goods and the object thereof. Construction of the various types of inspecting and trimming machines.

Shearing

The object. A consideration of the various types of shears for treating one or both sides at the same time, also the use of the usual cleaning devices such as, emery, sand, and card rolls, beaters, brushes, etc. Grinding and the adjustment of the various parts.

The use of brushing and cleaning machines, rolling devices, and calender attachments, for grey goods.

Singeing

Development and object of singeing. The construction of singers of all types, and for various purposes. The use of cooling tanks, steaming devices, rolling and brushing attachments.

Regulation of the flame for various goods and adjustment of the parts. Gas and air pressures, water cooled rolls. The effect of moisture on the cost of singeing, etc. The use of dry cans in connection with singeing. Electric singeing.

Washing

Open width and string washers. Their construction and operation. Soaps, Temperature, Squeeze rolls, etc. Washing of various goods and the object thereof. Stains.

Napping

The object of napping and the usual method of treating goods. Various types of nappers—Single—Double acting—Felting nappers, Construction, Grinding, and adjustment of various types.

Water Mangles

Their object and the construction of various types. Various rolls, iron husk, etc. Scutchers, their object and construction.

Starch Mangles

The object and construction of all types of starch mangles for pure starch and filled goods. Various types of rolls, brass, rubber, wood. Action of doctor blades, etc. Regulation and object of pressure.

Methods of starching and finishing all standard goods, also a consideration of the various substances used, such as starch, softener, fillers, etc. The preparation of starch and various methods of application.

Dryers and Stretchers

Both horizontal and vertical, Tenter frames, Clips. The swing motion and the finishes thus produced. Construction. Spraying machines, belt stretchers, button breakers. Their object, construction.

Calenders

The object and construction of all types, including the regulation of pressure and nips for the production of various finishes. Various types of rolls and their uses, steel, husk, and paper, etc. The use of hot and cold rolls. Chasing, friction, embossing and Schrier calenders, and the various finishes produced by each. Production of watered effects. Beetling machines.

Making up room—Yarding, Inspecting. Different types of folds. Pressing, papering, marking.

[COURSES I-VI]

PHYSICAL CULTURE—I

This subject is required of all students registered for first year work. It is taken one hour per week and consists of general athletic exercises in small squads on the campus during pleasant weather of the fall and spring. The exercises of the winter months are held in the school gymnasium. The instruction is given by the director of physical culture. Previous to the commencement of the work in the fall, each member of the class is required to submit to a thorough physical examination, a careful record of which is kept. Again at the end of the year another examination is held that progress may be noted.

The student's record depends both upon his regularity of attendance and upon the character of his work. A student who is not regular in attendance or who does not make sufficient progress in the work will be required to repeat the subject during the second year.

[ALL COURSES]

SCHOOL ADMINISTRATION

PRINCIPAL

- CHARLES H. EAMES, S. B., Massachusetts Institute of Technology, 1897. Experience: Secretary of the Lowell Textile School and instructor in electrical engineering and mathematics. Superintendent, Light, Heat and Power Company, Lowell, and engineer with Stone and Webster, electrical engineers, Boston, Mass.

INSTRUCTORS

TEXTILE ENGINEERING

- GEORGE H. PERKINS, S. B., chief instructor. Massachusetts Institute of Technology, 1899. Associate member American Society of Mechanical Engineers. Experience: Draftsman, Ludlow Manufacturing Company, Ludlow, Mass.; Lockwood, Greene and Co., Boston, Mass.
- HERBERT J. BALL, S. B., instructor in mechanical engineering. Massachusetts Institute of Technology, 1906. Experience: Draftsman, Watertown Arsenal.
- ULYSSES J. LUPIN, S. B., instructor in mathematics, physics and electrical engineering. Lawrence Scientific School, 1906. Experience: Draftsman, General Electric Company, Lynn, Mass.; with Winston Company, Metropolitan Water Board.
- FELIX D. LANGEVIN, part time instructor in machine shop practice, Lowell Textile School, and assistant superintendent Kitson Machine Shop, Lowell, Mass. Graduate Lowell Textile School, 1904.

CHEMISTRY AND DYEING

- LOUIS A. OLNEY, A. C., M. S., chief instructor. Lehigh University, 1896. Experience: Instructor, Brown University; dyeing and finishing department, Stirling Mills, Lowell, Mass.
- MILES R. MOFFATT, S. B., instructor in chemistry. Columbia University, 1901. Experience: Assistant instructor in physics, Columbia University; Chemist, Mallinckrodt Chemical Works, St. Louis, Mo.; Chemist, Atlantic Mills, Providence, R. I.
- ROBERT R. SLEEPER, instructor in dyeing. Lowell Textile School, 1900. Experience: Read, Holiday and Sons, Limited, New York City; H. A. Metz and Company, New York City; Hamilton Print Works, Lowell, Mass.; Merrimack Manufacturing Company, Lowell, Mass.
- HOWARD D. SMITH, Ph. D., instructor in chemistry. Tufts College, 1906; Brown University, 1904; Rhode Island College, 1901. Experience: Assistant instructor, Brown University, Tufts College; instructor, Beloit College, Wisconsin.

GEORGE A. CUSHMAN, A. M., instructor in Chemistry. Harvard College, 1907.

WALTER E. HADLEY, instructor in chemistry. Lowell Textile School, 1908.

FRANK L. MCCOOL, assistant instructor in dyeing. Lowell Textile School, 1910. Experience: Middlesex Bleach, Dye and Print Works, K. M. Gilmore and Co., Somerville, Mass.

TEXTILE DESIGN AND WEAVING

HERMANN H. BACHMANN, chief instructor. Gera Textile School, Germany. Experience: Gustav Weise Public Designing House for the City of Gera; Parkhill Manufacturing Company, Fitchburg, Mass.; Lorraine Manufacturing Company and Smith Webbing Company, Pawtucket, R. I.

ARTHUR F. FERGUSON, instructor in textile design and cloth analysis. Lowell Textile School, 1903. Experience: Chapman, Kendal & Daniels, wholesale dry goods, Boston, Mass.

STEWART MACKAY, instructor in hand loom weaving. Lowell Textile School, 1906. Experience: Bay State Mills, Lowell, Mass.; George C. Moore Wool Scouring Mills, North Chelmsford, Mass.

JOSEPH WILMOT, instructor in power weaving and warp preparation. Lowell Textile School, 1908. Experience: United States Bunting Company, Lowell, Mass.; Draper Company, Hopedale, Mass.; Crompton and Knowles Loom Works, Worcester, Mass.

ALBERT E. MUSARD, instructor in Jacquard weaving. Experience: Oldham Mills, Philadelphia, Pa., and Paterson, N. J.; Gloucester Rug Mills, Gloucester City, N. J.; Binder and Ellis, Philadelphia, Pa.

STARR H. FISKE, assistant instructor in cotton power weaving. Lowell Textile School, 1909. Experience: Amoskeag Manufacturing Company, Manchester, N. H.

ELIZABETH WHITNEY, instructor in freehand drawing. Normal Art School, Boston, 1882. Pupil of Dr. Denman W. Ross, lecturer in design, Harvard University. Experience: teaching eighteen years.

COTTON YARNS

STEPHEN E. SMITH, chief instructor. Lowell Textile School, 1900. Experience: Draftsman, Lowell Machine Shop, Lowell, Mass.; Atlantic Cotton Mills, Lawrence, Mass.; Shaw Stocking Company, Lowell, Mass.

HERBERT C. WOOD, instructor in cotton yarns. Lowell Textile School, 1906. Experience: Tremont and Suffolk Mills, Lowell; Whitin Machine Works, Whitinsville, Mass.

HENRY K. DICK, instructor in knitting. Experience: Linnville Hosiery Factory, Lanark, Scotland.

WOOLEN AND WORSTED YARNS

EDGAR H. BARKER, chief instructor. Massachusetts Institute of Technology, 1896. Experience: Pacific Mills, Lawrence, Mass.; E. Frank Lewis, Lawrence, Wool scouring.

JOHN N. HOWKER, instructor in wool sorting and scouring. Technical School of Saltaire, near Bradford, England; Certificate from City and Guilds of London. Experience: Saltaire Mills, Yorkshire, England; Goodall Worsted Company, Sanford, Maine; Arlington Mills, Lawrence, Mass.

HENRY H. CROMPTON, instructor in worsted yarns. Lowell Textile School, 1899. Experience: Arlington Mills, Lawrence, Mass.

EUGENE C. WOODCOCK, instructor in woollen yarns. Lowell Textile School, 1907. Experience: Wood Worsted Mills, Lawrence, Mass.

FINISHING

ARTHUR A. STEWART, chief instructor. Lachine Academy, Canada; Lowell Textile School, 1900. Experience: Dominion Woollen Manufacturing Company, Montreal, Canada; American Woollen Company Mills; Nonantum Worsted Mills, Newton, Mass.; instructor, woollen and worsted yarns, Lowell Textile School.

CULTURAL COURSES

LANGUAGES AND HISTORY

JOHN CLEMENT, A. B., instructor in commercial languages, English and history. Harvard College. 1894. Experience: Reporter, Boston Evening Transcript; Manager, Lamson, Wolfe and Co., Publishers, Boston; Editorial staff, Charles Dudley Warner's Library of the World's Best Literature, New York; International Library of Famous Literature, New York; teacher, Ballou and Hobigand Preparatory School, Boston. Harvard University, Summer Session. 1910.

PHYSICAL CULTURE

RALPH E. GUILLOW, physical director. International Y. M. C. A. Training School, Springfield, Mass., 1910. Ten years' experience in physical culture in various schools and institutions.

ARCHIBALD R. GARDNER, M. D., Medical Adviser. Harvard University, 1902.

ALUMNI ASSOCIATION

The Alumni Association of the School holds its annual meeting and banquet in Lowell on commencement day.

The membership of the Association is restricted to graduates of the day school. Honorary membership is open to the Board of Trustees, the Faculty and such others as may be elected by the Association.

The officers for year ending June, 1911 are :

President :	John A. Currier, '01
Vice-President :	Thomas T. Clark, '10
Secretary-Treasurer :	Arthur A. Stewart, '00

Board of Directors: The President, Vice-President, Secretary-Treasurer, Henry A. Bodwell, '00, for one year, and Stephen E. Smith, '00, for two years. Communications should be addressed to Arthur A. Stewart, Lowell Textile School.

THE SOUTHWICK TEXTILE CLUB

The object of the Club is to promote the welfare of the School and the social and intellectual interests of its past students.

The membership is restricted to all persons who have attended the day classes of the School for at least one year and who are not, at the time of making application to the Club, students thereof.

The Club was organized on February 23, 1907, and at present has about seventy-five members. The officers of the Club are :

President :	Royal P. White, '04
Vice-President :	Arthur C. Varnum, '06
Secretary-Treasurer :	Arthur A. Stewart, '00

Executive Board: President, Vice-President, Secretary-Treasurer, Henry A. Bodwell, '00, and Stephen E. Smith, '00.

DAY CLASS OF 1910

Graduates with Titles of Theses

Diplomas awarded as follows, June 3, 1910:

- | | | |
|---------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|
| Peter Joseph Arienti, | Chemistry and Dyeing,
Thesis with L. N. Putnam. | Great Barrington, Mass. |
| | "An Experimental Research into the Properties of Electrolytic Sodium Hypochlorite as Compared with the Sodium Hypochlorite made Chemically, and Calcium Hypochlorite." | |
| Julian Clinton Cary, | Textile Engineering, | Lowell, Mass. |
| | "Design of proposed Power Plant for Lowell Textile School." | |
| Thomas Talbot Clark, | Wool Manufacutring, | North Billerica, Mass. |
| | "Comparison of Worsted Yarn made on Four Systems."
Also Thesis with W. L. Keough. | |
| Joseph Edward Duval, | Wool Manufacturing, | Jamaica Plain, Mass. |
| | Thesis with J. A. Murray.
"The Manufacture of a Semi-close Finish Worsted." | |
| Harry Francis Finlay, | Chemistry and Dyeing, | Lawrence, Mass. |
| | "Fastness of Dyestuffs to Sunlight, in the Presence of Different Gases." | |
| Roland Hartwell Fletcher, | Textile Engineering, | Littleton, Mass. |
| | "Efficiency Tests of Steam-hydraulic Elevator." | |
| Harry Laburton Gale, | Textile Designing, | Cambridge, Mass. |
| | "Influence of Color in Textile Fabrics." | |
| George Goldberg, | Textile Engineering, | Malden, Mass. |
| | Thesis with L. Hurtado, Jr.
"Economy Tests of 25 K. W. Kerr Turbo Generator Set." | |
| Philip Lewis Hardy, | Textile Engineering, | Andover, Mass. |
| | "Comparative Efficiency Tests of Paper and Cork Insert Motor Pulleys." | |
| Woodbury Kendall Howe, | Cotton Manufacturing, | Groton, Mass. |
| | "Details of Manufacture of Special Bath Towels and Rugs." | |
| Leopoldo Hurtado, Jr., | Textile Engineering, | Mexico City, Mexico. |
| | Thesis with G. Goldberg. | |
| William Oscar Jelleme, | Cotton Manufacturing, | Passaic, N. J. |
| | "Details of Manufacture of Fancy Shirtings." | |
| Wesley Lincoln Keough, | Wool Manufacturing, | Winthrop, Mass. |
| | Thesis with T. T. Clark,
"The Manufacture of a Fancy Worsted." | |
| Arthur Franklin Lamb, | Wool Manufacturing, | Rockland, Maine. |
| | "The Manufacture of Woolen Suiting." | |
| Frederick David Manning, | Chemistry and Dyeing, | Fitchburg, Mass. |
| | "The Piece Dyeing and Printing of Cloth Containing Chlorinated, Unchlorinated and Resisted Worsted Yarns." | |

- Frank Leslie McCool, Chemistry and Dyeing, Mansfield, Mass.
 "The Influence of Various Salts and Methods in the
 Dyeing of Mordant Acid Colors."
- James Andrew Murray, Wool Manufacturing, Somerville, Mass.
 Thesis with J. E. Duval.
- Raymond Elmore Nichols, Textile Engineering, Wakefield, Mass.
 Thesis with W. Anderson.
 "Thermal Efficiency of Drying Cans."
- Leverett Nelson Putnam, Chemistry and Dyeing, Danvers, Mass.
 Thesis with P. J. Arienti.
- Norman Bagnell Reed, Cotton Manufacturing, Malden, Mass.
 "Details of Manufacture of Fine Cotton and Silk Dress Goods."
- Frederick William Charles Robson, Chemistry and Dyeing, Lowell, Mass.
 "An Illustration, by Dyeing, of the Principles Underlying the Formation
 of Primary, Secondary and Tertiary Colors."
- Doane White Smith, Wool Manufacturing, Westfield, Mass.
 "The Manufacture of a Worsted Suiting."
- Theophilus Gilman Smith, Jr., Chemistry and Dyeing, Groton, Mass.
 Thesis with C. E. O'Connell.
 "Photo-micrographic Study of the Fibres."
- Irving Nichols Stronach, Chemistry and Dyeing, Lowell, Mass.
 "Comparison of Cotton Reds as to Fastness, Cost and Usefulness."
- Roscoe Myron Whitcomb, Chemistry and Dyeing, Winchester, Mass.
 "The Relative Value of Red Coloring Matters for Use as Textile Marking Inks."

EVENING CLASS OF 1910

Certificates awarded as follows, May 4, 1910:

COURSE I—2 YEARS. (Cotton Spinning)

Carl Eugene Bailey	Lowell, Mass.
Heisayu Fujiyoshi	Lowell, "
Arthur Winifield Hird	Lowell, "
Arthur Lemire	Lowell, "
John Henry Shackleton	Lawrence, "
Allen Reed Williams	Lowell, "
John Alfred Worthington	Lowell, "

COURSE IIb—3 YEARS. (Worsted Spinning)

Ellsworth Otis Caldwell Hill	Lawrence, Mass.
Samuel Scott Kershaw	North Chelmsford, "

COURSE III—3 YEARS. (Designing)

Joseph Harris Burgess	Methuen, Mass.
Edward James Cox	Lowell, "
Paul Carl Hering	Lawrence, "
Albert Augustus Hodgkins	Lowell, "
Albert Louis Mabbett	Lowell, "
Francis Xavier Root, Jr.	Lowell, "

COURSE IV—4 Years. (Chemistry and Dyeing)

Hugh Christison	Methuen, Mass.
Frederic Whitney Jordan	Lowell, "
Henry Stewart Redman	Lowell, "
William Wright Stewart	Lawrence, "
Samuel Stott	Lawrence, "
Frederick Augustus Whitney	Lowell, "

COURSE IV—2 YEARS. (Elementary Chemistry)

George Clifford Dunn	Lowell, Mass.
James Alfred Hird	Lowell, "
Gavin Oates Holt	Lowell, "
Joseph Albert LaJeunesse	Lowell, "
John Nicoll	Andover, "
William Paris Whitman	Lowell, "

COURSE Va—1 YEAR. (Cotton Weaving)

Harry Anderton	Lowell, Mass.
Lester Ambrose Flemings	Lowell, "
George Edward Hibbert	Lowell, "

COURSE Vb—1 YEAR. (Woolen and Worsted Weaving)

Norman Atkinson	Lowell, Mass.
Percy William Berry	Lawrence, "
Robert Rolly Bourchard	Lowell, "
John Alfred Deely	Lowell, "
Fred Ignatius Duckett	Lawrence, "
Louis Voltine Eklund	Dracut, "
Patrick Flynn	Lowell, "

William Gauthier	Lowell, Mass.
William Innes Houston	Lawrence, "
Thomas Vincent Hutton	Lowell, "
Samuel Henry McElroy	Lowell, "
Hiram Gabriel Messiah	Lawrence, "
Gustave Adolph Nelson	Lowell, "
Clarence Willard Nichols	Lawrence, "
Bertram Sewall Stott	Andover, "

COURSE Vc—1 YEAR. (Dobby and Jacquard Weaving)

Jonas Banks	Lowell, Mass.
Ethan John Bourchard	Lowell, "
Fred Fielding	Lowell, "
Martin J. Hoellrich	Lawrence, "
Leopoldo Hurtado, Jr.	Lowell, "
Benn Kershaw	Lowell, "
Ernest H. Nelson	Lowell, "
Thomas Robinson	Lowell, "

COURSE VIa—3 YEARS. (Mechanics and Electricity)

Lawrence Francis Dulligan	Lowell, Mass.
William Babcock Hilliard	Lowell, "
Adhemard Charles Jean	Lowell, "
Birger Petterson	Lowell, "

COURSE VIb—3 YEARS. (Mechanical Drawing)

Frank Jackson	Methuen, Mass.
Patrick David McAuliffe	Lowell, "
Joseph Paquin	Lowell, "
Michael Francis Sullivan	Dracut, "
Benjamin Lewis Welch	Lowell, "

COURSE VIc—3 YEARS. (Architectural Drawing)

Edward Gaston Campbell	Lowell, Mass.
Linville Theodore Jorde	Lowell, "
Leo Maurice Maxcy	Lowell, "

COURSE VIId—3 YEARS. (Freehand Drawing)

Edith Erma Gaspar	Lowell, Mass.
Alice Louise Gookin	Lowell, "
Blanche Hilda Ledoux	Lowell, "
Mary Isabella Phelps	Lowell, "

COURSE VIe—2 YEARS. (Machine Shop Practice)

Albert Joseph Cutress	Lowell, Mass.
John Flynn	Lowell, "

COURSE VII—1 YEAR. (Woolen and Worsted Finishing)

John Horace Hunton	Lowell, Mass.
George Krause	Lawrence, "
Arthur James Leck	Lowell, "
William Herbert Stopherd	Lowell, "
Henry Todd	Andover, "

REGISTER OF DAY STUDENTS

1910 - 1911

Third Year

Name	Course	Address
Adams, Tracy A.	IV	Bridgewater, Mass.
Bailey, Walter J.	IV	Watertown, "
Blaikie, Howard M.	II	Medford, "
Bragg, Harold N.	IV	Medway, "
Cameron, Elliott F.	IV	Beverly, "
Chandler, Proctor R.	IV	North Andover, "
Chisholm, Lester B.	I	Melrose Highlands, "
Culver, John H.	IV	Ayer, "
Dewey, Maurice W.	II	Lowell, "
Estey, Paul F.	IV	Gardner, "
Faulkner, Richard M.	Sp. II	Keene, N. H.
Flynn, Thomas P.	IV	Fitchburg, Mass.
Ford, Edgar R.	IV	Lawrence, "
Gainey, Francis W.	IV	Lawrence, "
Hay, Ernest C.	II	Pittsfield, "
Hendrickson, Walter A.	II	Wakefield, "
Hubbard, Ralph K.	IV	Norwood, "
Hunton, John H.	II	Lowell, "
Jefferson, Roswell C.	IV	Lowell, "
King, Dan E.	VI	Lowell, "
Martin, Harry W.	IV	Marblehead, "
Merrill, Allan B.	IV	Lynn, "
Middleton, James A.	IV	Lowell, "
Moore, Karl R.	IV	Newton Highlands, "
Morris, Joseph P.	III	Utica, N. Y.
O'Connell, Clarence E.	IV	Andover, Mass.
Pearson, Alfred H.	IV	Springvale, Me.
Phillips, Fred T.	IV	Lynn, Mass.
Rich, Everett B.	III	Worcester, "
Sidebottom, Leon W.	IV	Lowell, "
Signor, Clarence E.	IV	Worcester, "
Standish, John C.	IV	Segreganset, Dighton, "
Toshach, Reginald A.	II	Methuen, "
Walker, Alfred S.	II	Malden, "
Watson, William	III	Haverhill, "
Wood, Ernest H.	IV	Andover, "

Second Year

Bigelow, Prescott F.	II	Jamaica Plain, Mass.
Brown, Rollins	IV	Salem, "
Burke, Henry B.	IV	South Acton, "
Casey, Henry F.	I	Roxbury, "
Caswell, Glen B.	Sp. VI	Dracut, "
Coan, Charles B.	IV	Ward Hill, "
Conant, Richard G.	I	Littleton, "
Crane, Edwin M.	I	Blackstone, "
Dalton, Gregory S.	IV	Lawrence, "
Dalton, John, Jr.	IV	North Adams, "

Name	Course	Address
Daw, Arthur J.	IV	North Andover, Mass.
Dearth, Elmer E.	IV	Lowell, "
Demuth, Herbert E.	IV	Lisbon Falls, Me.
Dunning, Hazard A.	I	Cambridge Mass.
Edmands, Frederick P.	Sp. III	Hingham, "
Elliot, Gordon B.	II	Grafton, "
Engstrom, Karl E.	VI	Lancaster, "
Frost, Harold B.	II	Somerville, "
Goodale, William P.	I	Clinton, "
Hartford, Nathan B. E., Jr.	Sp. III	Watertown, "
Hartshorn, George T.	II	Norwood, "
Hassett, Paul J.	IV	Fitchburg, "
Hathaway, Henry B.	Sp. III	Salem, "
Hodecker, John N.	IV	Adams, "
Holmes, Otis M.	VI	Haverhill, "
Hood, Leslie N.	IV	Nashua, N. H.
Jack, Charles H.	Sp. VI	Manchester, "
Jackson, William L.	IV	Flint, Mich.
Lamont, Robert L.	II	Malden, Mass.
Leitch, Harold W.	IV	North Andover, "
Lillis, Marvin H.	IV	Lawrence, "
Main, Moses T.	IV	Newport, R. I.
Marland, Harold W.	VI	Andover, Mass.
McCleary, Samuel W.	Sp. IV	Lowell, "
McDuff, Henry C.	II	Pawtucket, R. I.
Munroe, Sydney P.	I	Melrose, Mass.
Murphy, Howard H.	Sp. VI	Boston, "
Niven, Robert S.	VI	Saugus, "
Noyes, Philip A.	Sp. III	Haverhill, "
Pensel, George R.	IV	Fitchburg, "
Pottinger, James G.	II	West Roxbury, "
Preston, Harold L.	II	Woonsocket, R. I.
Roche, Raymond V.	IV	Uxbridge, Mass.
Rogers, Miles E.	I	Lowell, "
Rundlett, Arnold D.	VI	Haverhill, "
Sayward, Ralph K.	Sp. I	Winchester, "
Shea, Francis J.	II	Ware, "
Stubbs, Samuel A.	IV	Haverhill, "
Sullivan, John D.	VI	Bradford, "
Thaxter, Joseph B., Jr.	II	Hingham, "
Walsh, Martin F.	Sp. IV	Fitchburg, "
Weeks, Harry F.	II	Malden, "
Whitehill, Warren H.	IV	Groton, "
Whittier, Sumner C.	IV	Reading, "
Williams, Harrison M.	II	Haverhill, "
Wiswall, Frank T.	Sp. III	Lawrence, "
Yavner, Harry	II	Somerville, "

First Year

Allen, Joseph P.	I	Pawtucket, R. I.
Ashkenazy, Isadore	IV	Lawrence, Mass.
Ayers, Iverne C.	VI	Clinton, "
Batcheller, Floyd N.	Sp. III	Worcester, "
Bell, William T.	Sp. III	Anniston, Ala.
Bennett, Herbert B.	II	Lowell, Mass.

Name	Course	Address
Berger, Robert	IV	Boston, Mass.
Blood, Prentice W.	II	Concord Junction, "
Church, Harold P.	III	Providence, R. I.
Clark, Ralph B.	II	Plymouth, Mass.
Cleary, Charles J.	II	Boston, "
Cogswell, Wilder D.	II	Bradford, "
Cook, Kenneth B.	I	Concord, "
Cooke, Harrison A.	I	Lowell, "
Crawford, John W.	IV	Lawrence, "
Creese, Guy T.	IV	Danvers, "
Davieau, Arthur N.	VI	Cochituate, "
Davis, Alexander D.	VI	Lowell, "
Dearborn, Roy	VI	Andover, "
Dover, James A.	VI	Winchester, "
Feindel, Catherine E.	Sp. III	Chelmsford, "
Finneran, William C.	VI	Jamaica Plain, "
Fletcher, Howard S.	--	Newport, N. H.
Halstead, Frank K.	II	Norwood, Mass.
Harding, Harry O.	VI	Stoneham, "
Harding, Richard B.	Sp. IV	Cohasset, "
Hastings, Warren R.	I	Malden, "
Horne, Herbert W.	Sp. IV	Lowell, "
Horton, Chester T.	VI	Wilmington, "
Hosmer, Joseph B.	Sp. IV	Manchester, N. H.
Howard, Frederick S., Jr.	VI	Bradford, Mass.
Hutchinson, Myron R.	IV	Salem, "
Jefferson, Richardson P.	I	Lowell, "
Johnson, Arthur K.	IV	Andover, "
Kaplan, Maurice	IV	Boston, "
Katten, Myron	III	Hartford, Conn.
Kelsey, Oscar E.	VI	Lowell, Mass.
Kimball, Ralph H.	II	Goff's Falls, N. H.
Leffingwell, Raymond D.	I	Burlington, Vt.
Madden, Francis P.	I	Revere, Mass.
Magee, Lowell F.	IV	Dorchester Centre, "
Martin, Joseph H.	Sp. III	Lowell, "
Mather, Harold T.	VI	Lowell, "
McArthur, Arthur, Jr.	II	West Roxbury, "
McArthur, Osborn	II	Watertown, "
McCarthy, Michael J.	IV	East Bridgewater, "
McIntosh, John J.	VI	Andover, "
McNeilis, Robert E.	I	Arctic, R. I.
Minis, Carol E.	I	Savannah, Ga.
Morin, Pamphile	Sp. IV	Lowell, Mass.
Murray, James	IV	Lawrence, "
Noahson, Louis L.	--	Boston, "
O'Brien, Walter A., Jr.	VI	Newton, "
O'Neill, Charles F.	IV	Lowell, "
Peck, Carroll W.	IV	Hanover, Conn.
Perkins, Jacob R.	I	Essex, Mass.
Pillsbury, Ray C.	I	Manchester, N. H.
Pinanski, Samuel	III	Dorchester, Mass.
Pirie, Robert H.	III	Revere, "
Plummer, Elliot B.	IV	Lawrence, "
Poor, Nathan H., 2nd	IV	Danvers, "
Putnam, Philip C.	IV	Danvers, "

Name	Course	Address
Rayner, Charles H.	IV	Waltham, Mass.
Ridley, Charles K.	VI	Malden, "
Riggs, Homer C.	VI	South Essex, "
Ryder, Howard W.	I	Malden, "
Shapiro, Maurice	II	Winthrop, "
Shedd, Howard P.	IV	West Medford, "
Shuttleworth, Wright	II	Amsterdam, N. Y.
Smith, Edward P.	II	Holliston, Mass.
Spencer, Constant S.	II	Pawtucket, R. I.
Stevens, Howard A.	I	Malden, Mass.
Sylvain, Chares E.	VI	Manchester, N. H.
Thomson, Alexander	II	Malden, Mass.
Walen, Ernest D.	VI	Gloucester, "
Ward, Herbert H.	II	Gilbertville, "
Ware, Carl E.	I	Peabody, "
Waterhouse, Richard E.	II	Centreville, R. I.
Waterman, Andrew S.	I	Warren, "
Weinberger, Isidor	IV	East Somerville, Mass.
Wilson, Alfred E.	Sp. III	Pascoag, R. I.
Woodward, Ernest C.	Sp. III	Rockland, Mass.
Wright, Dorothy Q.	Sp. IIIb	Lowell, "
Zobel, Carl J.	II	Lowell, "

Specials

Aspinwall, William M.	I	Pawtucket, R. I.
Comey, Henry C.	VI	Melrose, Mass.
Hammond, James W.	II	Wooster, Ohio
Hinchliff, Ralph	I	Rockford, Ill.
Johnson, Arthur W.	- -	Portage, Wis.

Post Graduates

Name	Address
Adams, Henry S.	Chester, S. C.
Ballard, Horace W. C. S.	Newport, N. H.
Barr, I. Walwin	New York, N. Y.
Bradford, Roy H.	Andover, Mass.
Brickett, Chauncy J.	Scranton, Pa.
Campbell, Orison S.	Dolgeville, N. Y.
Carter, Robert A.	South Amboy, N. J.
Clapp, F. Austin	New York, N. Y.
Clogston, Raymond B.	North Adams, Mass.
Culver, Ralph F.	Norwood, Mass.
Currier, John A.	Haverhill, Mass.
Dewey, James F.	Quechee, Vt.
Dwight, John F., Jr.	Pawtucket, R. I.
Farmer, Chester J.	Andover, Mass.
Ferguson, Arthur F.	Lowell, Mass.
Foster, Clifford E.	Whitehall, N. Y.
Gahn, George L.	Lawrence, Mass.
Gay, Olin D.	Cavendish, Vt.
Haskell, Walter F.	Westbrook, Me.
Hathorn, George W.	North Andover, Mass.
Hildreth, Harold W.	Lawrence, Mass.
Hollings, James L.	Dorchester, Mass.

Name	Address
Hook, Russell W.	West Medford, Mass.
Huising, Geronimo H.	Trozo, Manila, P. I.
Jenckes, Leland A.	Chicopee, Mass.
Jones, Everett A.	Auburn, N. Y.
Jury, Alfred E.	Burlington, Vt.
Knowland, Daniel P.	New York, N. Y.
Lewis, LeRoy C.	Whitehall, N. Y.
Lewis, Walter S.	Washington, D. C.
Lucey, Edmund A.	Saylesville, R. I.
Mackay, Stewart	North Chelmsford, Mass.
Mailey, Howard T.	Lawrence, Mass.
Moore, Everett B.	Lowell, Mass.
Moorhouse, William R.	Boston, Mass.
Najarian, Garabed	Housatonic, Mass.
Parker, Everett N.	Lewiston, Me.
Prince, Sylvanus C.	Lowell, Mass.
Raymond, Charles A.	Boston, Mass.
Reynolds, Fred B.	North Andover, Mass.
Sleeper, Robert R.	Lowell, Mass.
Stevens, Dexter	Clinton, Mass.
Thompson, Henry J.	Malden, Mass.
Varnum, Arthur C.	Lowell, Mass.
Webb, Frank H.	Haverhill, Mass.
Wheelock, Stanley H.	Uxbridge, Mass.
White, Royal P.	Lowell, Mass.
Wingate, William H.	Shelton, Conn.
Wise, Paul T.	Clinton, Mass.

REGISTER OF EVENING STUDENTS

1910 - 1911

Explanatory Note

Course I Cotton Spinning
 Course II (a) Woolen Spinning
 Course II (b) Worsted Spinning
 Course III Designing
 Course IV Chemistry and Dyeing
 Course IV (a) Elementary Chemistry
 Course IV (b) Textile Chemistry and Dyeing
 Course IV (c) Analytical Chemistry
 Course IV (d) Textile and Analytical Chemistry
 Course V (a) Cotton Weaving
 Course V (b) Woolen and Worsted Weaving
 Course V (c) Dobby and Jacquard Weaving
 Course VI (a) Mechanics and Electricity
 Course VI (b) Mechanical Drawing
 Course VI (c) Architectural Drawing
 Course VI (d) Freehand Drawing
 Course VI (e) Machine Shop
 Course VII Woolen and Worsted Finishing

Fifth Year

Name	Course	Address
Christison, Hugh	IV	Methuen, Mass.

Fourth Year

Heaton, Forster G.	IV	Lowell, Mass.
Ledoux, Blanche H.	P. G. VI d	" "
Logan, George H. S.	IV	Lawrence, "

Third Year

Archambault, Annette J.	VI d	Lowell, Mass.
Baldwin, Tom	VI a	" "
Ballinger, William E.	II b	North Chelmsford, "
Brown, James H.	VI a	Forge Village, "
Brown, William F.	VI b	Lowell, "
Carpilio, John A.	VI a	Lawrence, "
Churchill, Charles W.	III	Lowell, "
Cochrane, John	VI b	" "
Cote, George W.	VI b	" "
Cox, Edward J.	III	" "
Crosby, Wesley R.	VI a	Dracut, "
Dean, Hubert R.	VI b	Methuen, "
Dozois, Emilie M.	VI d	Lowell, "
Dulligan, Thomas	VI a	" "
Ekengren, Per W.	VI a	" "

Name	Course	Address
Hammond, James W.	IIb	Lowell, Mass.
Hodge, William	VIa	Andover, "
Johnson, Arthur W.	IIb	Lowell, "
Kennedy, William E.	VIa	Lawrence, "
Lachance, Melina	VIId	Lowell, "
Lozeau, Lorette	VIId	" "
Macdonald, Chester W.	VIa	" "
Milot, Joseph E.	VIc	" "
Murphy, Howard H.	IIb	" "
Newsholme, Charles E.	VIb	Methuen, "
Nichols, Nathan A.	VIb	Lowell, "
Nicoll, George B.	VIa	Andover, "
Palm, Carl H.	VIa	Lowell, "
Perry, Clarence R.	IIb	Lawrence, "
Racicot, Marie E.	VIId	Lowell, "
Scannell, George P.	VIb	" "
Stanley, John R.	IIb	North Chelmsford, "
Taylor, George A.	III	Methuen, "
Tennant, Joseph A.	VIb	" "
Thorpe, George H.	VIa	Lowell, "
Ward, Bernard D.	III	" "
Watson, William	VIa	Haverhill, "
Willmott, Herbert J.	VIa	Lowell, "

Second Year

Allen, William J.	IVa	Lawrence, Mass.
Alter, Frederick A.	IVa	" "
Andrews, Oliver	I	Lowell, "
Armstrong, Lester H.	VIa	" "
Baldwin, Tom	VIa	" "
Barnes, Joseph	I	Andover, "
Bastow, Percy	IVa	Methuen, "
Bernier, Louis	VIb	Lowell, "
Birkby, Charles H.	IVa	" "
Blanchette, Eugene	VIId	" "
Boije, Walter	IIb	" "
Bottomley, Edward P.	IIb-III	Collinsville, "
Bottomley, William A.	IVa	" "
Burke, Thomas J.	III	" "
Burke, William A.	IVa	Lowell, "
Butterfield, Maurice A.	VIa	" "
Buzzell, Fred S.	III	Methuen, "
Campbell, Alexander	VIa	Lowell, "
Champagne, Donat	VIb	" "
Christenson, John O.	VIb	" "
Clark, John W.	IVa	Lawrence, "
Condon, John A.	IVa	North Billerica, "
Cook, Arthur	IVa	Lowell, "
Crosby, Wesley R.	VIa	Dracut, "
Davis, Howard C.	III	Lawrence, "
Downs, John F.	VIe	Lowell, "
Dulligan, Charles E.	IVa	" "
Ekengren, Hilding C.	VIId	" "
Engstrom, Karl E.	VIa	" "

Name	Course	Address
Fagan, Thomas M.	VIb	Lowell, Mass.
Faulkner, Richard M.	VIa	" "
Ferguson, Eva B.	VIb	" "
Fournier, Albert A.	I	" "
Freeman, Ralph W.	IVa	" "
Gakidis, Alexander N.	IVa	" "
Garrity, Joseph F.	VIe	" "
Geary, John W.	IVa	" "
Gilman, Edward L.	VIa	" "
Glennon, Edward M.	IVa	Lawrence, "
Goodchild, George	IIb	Lowell, "
Graves, John F.	VIb	" "
Gustafson, Alfred L.	IVa	" "
Guyton, Alice K.	VI d	" "
Guyton, Anna P.	VI d	" "
Haley, James A.	VIe	" "
Harrall, William	VIa	" "
Hartwell, Marcus H.	I	" "
Heap, Joseph A.	III	" "
Herron, Alexander T.	IVa	Lawrence, "
Higginson, Joseph H.	III	Haverhill, "
Hogg, Frank H.	IIb	Lowell, "
Holdsworth, Frank	IIb	" "
Holland, Walter F.	III	Lawrence, "
Hooper, Thomas A.	IIb	" "
Horne, Herbert W.	IVa	Lowell, "
Howard, Francis W.	VIa	" "
Johnson, Henry L.	VIa	" "
Judge, Martin	IIb	Lawrence, "
Kent, Arthur	VIb	Lowell, "
Kerrigan, Arthur J.	VIa	" "
Lambert, Harry	IIb	Methuen, "
Lang, William A.	VIa	Lowell, "
Lapierre, Alderic B.	III	" "
Laporte, Philip J.	IVa	" "
Linberg, Joseph F.	IVa	" "
Lincourt, Jeanne	VI d	" "
Lowe, John C.	IIb	Methuen, "
Manning, James B.	IVa	Lowell, "
Marsden, Phillips B.	IVa	Lawrence, "
Maxcy, Leo M.	VIb	Lowell, "
McCann, Joseph H.	IVa	" "
McKone, Peter	VIa	" "
McLoon, Dudley P.	VIb	" "
Moynahan, John E.	VIa	" "
Muldoon, Joseph	VIb	Lawrence, "
Mulrooney, John J.	VIe	Lowell, "
Murphy, Howard H.	IIb	" "
Nelson, James A.	I	" "
Nelson, Sigfred	VIe	" "
Newall, Preston	I	" "
Nichol, Samuel J.	IVa	" "
Oertelt, Jean O. F.	VIa	" "
Orrell, Frank L.	IIb	" "
O'Sullivan, Bartholomew B.	IVb	" "
Paquette, Donat N.	III	" "

Name	Course	Address
Pedler, William A.	IVa	Methuen, Mass.
Peterson, David E.	VIe	Lowell, "
Petterson, Birger	VIa	" "
Racicot, Marie E.	VI d	" "
Redman, Henry S.	VIa	" "
Rice, Thomas G.	IIb	" "
Riley, Edward T.	III	North Billerica, "
Rogers, John F.	I	Lowell, "
Sanborn, Edith T.	VI d	" "
Scidmore, Russell P.	VIb	" "
Shaffer, William A.	VIe	" "
Shinnick, George H.	VIa	Lawrence, "
Smith, William F.	VIe	Lowell, "
Stearns, Orlo F.	IVa	Chelmsford, "
Stevens, Harold S.	III	Haverhill, "
Stevenson, William G.	VIe	Tewksbury, "
Stewart, George	I	Lowell, "
Sugden, Albert G.	III	" "
Swanson, Victor E.	VIb	" "
Swanson, Victor E.	IVa	" "
Taylor, Harold S.	VIb	" "
Thorpe, George H.	VIa	" "
Turgeon, Roderick	IVa	" "
Walton, Frank L.	I	" "
Wicks, Frederic M.	III	Haverhill, "
Wiggins, Fred E.	VIb	Lowell, "
Wikstrom, Anders G.	VIa	" "
Wild, Thomas	VIb	" "
Wilkinson, Joseph	III	" "

First Year

Aham, Frederick T.	VIa	Lowell, Mass.
Albert, Bernadette	VI d	" "
Albrecht, George	VIa	" "
Alexander, William J.	I	" "
Allard, Damasse G.	VIb	" "
Alston, John R.	IVa	Lawrence, "
Anderton, Harry	III	Lowell, "
Andrews, Oliver	Va	" "
Atkinson, Reginald C.	IVa	" "
Balian, Habib	IVa	Lawrence, "
Bamford, John W.	Vc	Lowell, "
Banks, Jonas	III	" "
Barbera, Antonio A.	VIb	" "
Barlow, John F.	VIa	" "
Barnard, Leah L.	III	" "
Barrington, Fred	VIa	Lawrence, "
Barrows, Ariston K.	IVa	Lowell, "
Baxter, Thomas J.	VIb	" "
Beaulieu, William E.	IIb	" "
Bell, Charles W.	VIa	" "
Belleville, Leo L.	VIa	" "
Bennett, Harold W.	IVa	" "
Bentley, Guy	VIe	" "

Name	Course	Address
Bernard, Joseph E.	VIe	Lowell, Mass.
Black, John H.	VIIb	Andover, "
Blackburn, John	Va	Lowell, "
Blais, Emile	VIe	" "
Blanchette, Eugene	III	" "
Boije, Walter	IIb	" "
Boland, James J.	VIa	" "
Bottomley, William A.	VII	Collinsville, "
Boucher, Edmund J.	IIb	North Chelmsford, "
Boulay, Lazare	VIb	Lowell, "
Bowyer, Thomas B.	IIb	Lawrence, "
Brainerd, Albert C.	I	" "
Brainerd, Harry C.	I	" "
Brassard, Maurice	VIa	Lowell, "
Breen, David F.	IVa	" "
Brennan, Charles F.	Va	" "
Brennan, John F.	IVa	" "
Brennan, Timothy J.	Vb	Collinsville, "
Brick, George W.	III	Lowell, "
Bridgford, Clifford	VIa	" "
Bridgford, Royal A.	VIa	" "
Briere, Joseph	I	" "
Brine, Paul B.	III	Somerville, "
Brown, William F.	VIa	Lowell, "
Browne, Charles D.	I	" "
Bryan, Levi A.	VIa	Andover, "
Burke, James F.	Vc	Lowell, "
Burke, William A.	IVa	" "
Burns, Charles J.	VIa	" "
Butler, William H.	Va	" "
Calder, Andrea E.	VId	" "
Caldwell, James	VIa	Andover, "
Callahan, William J.	VIa	Lowell, "
Carlin, James J.	IIb	" "
Carney, Joseph F.	VIa-e	" "
Carty, Thomas P.	Vb	" "
Chadwick, Norman	IIb	Lawrence, "
Champagne, Wilfred A.	I	Lowell, "
Charleton, Peter	VIa	" "
Chidlow, Alfred H.	VIa	Lawrence, "
Chouinard, Henry	VIa	Lowell, "
Church, Harold P.	I	" "
Clarke, Wesley J.	III	Ballardvale, "
Clement, Walter E.	VIa	Lowell, "
Coan, Andrew J.	VIb	" "
Cochrane, William	VIa	" "
Cogger, Frank P.	VIa	" "
Collins, Frank J.	VIb	" "
Collins, Thomas	VIb	" "
Collins, Thomas J.	VIa	" "
Colton, John A.	VIa	" "
Comey, Henry C.	I	Melrose, "
Conley, George W.	I	Lowell, "
Connell, John	VIa	" "
Cook, Arthur	IVa	" "
Cooney, James E.	IVa	" "

Name	Course	Address
Copson, William F., Jr.	III	Lowell, Mass.
Cordingly, Martin S.	VIa	" "
Costello, John J.	VIa	" "
Cote, Fred J.	VIa	Lawrence, "
Cox, Edward J.	Va	Lowell, "
Cronshaw, James	VII	Methuen, "
Crumbie, Charles	VIa	Lowell, "
Cudmore, Edward T.	VIa	" "
Cummings, George A.	VIa	" "
Curry, William H. F.	VIb	" "
Curtis, Arthur	VIa-b	" "
Cushing, Ezra J.	VIa	" "
Cutress, Albert J.	VIa	" "
Danckert, Peter R.	Vb	" "
Davis, Alfred A.	VIa	" "
Decelle, Odilon	Vc	" "
Delaney, Michael J.	Vb	" "
DeLong, Arthur E.	III	" "
Desaillier, Adolph	VIa	" "
Dick, Henry K.	I	" "
Dillon, Thomas	VIa	" "
Dinneen, John L.	VIb	" "
Dodge, Ernest W.	Vb	" "
Doherty, Samuel J.	VIa	" "
Doole, John T.	IVa	" "
Dowd, Margaret	VIId	" "
Doyle, John B.	VIa	" "
Dresser, William H.	VIa	" "
Droney, John J.	VIe	" "
Dubois, Alexandre	VIa	" "
Dulligan, Lawrence F.	VIa	" "
Dumont, Charles E.	VIa	" "
Dunfey, John A.	VIb	" "
Dunn, Frank	VIa	" "
Dunn, George C.	IVb	" "
Dunning, Hazard A.	I	" "
Duval, Joseph E.	IVa	" "
Dyer, Harold E.	VIa	" "
Early, Charles	VIa	" "
Eck, Aaron	III	Somerville, "
Edwards, William F.	VII	Lowell, "
Egan, John J.	III	" "
Eklund, Louis V.	VIa	Dracut, "
Ellis, Samuel M.	VIa	Lawrence, "
Emonds, Joseph A.	Vb	Lowell, "
Enlind, Charles J.	VIa	" "
Farnham, Erle F.	I	" "
Field, Leslie A.	VIa	" "
Filamondi, Januarius J.	III	" "
Flaherty, William	Vb	" "
Flanagan, Leo F.	VIa	" "
Flanders, George A.	VIa	" "
Flathers, Charles H.	VIb	Lawrence, "
Flemings, Lester A.	III	Lowell, "
Flood, Clarence R.	VIId	" "
Flynn, John	VIb	" "

Name	Course	Address
Foley, John	I	Lowell, Mass.
Fontaine, Edmond P., Jr.	VIa	" "
Forrest, William	VIa	" "
Freckleton, Francis J.	VIa	" "
Freeman, George D.	VIa	" "
French, George W., Jr.	IIb	Lawrence, "
Frothingham, Newton S.	I	Lowell, "
Fujiyoshi, Heisayu	Va	South Lowell, "
Fuller, Bert	VIa	Lowell, "
Fuller, Ediom M.	III-Va	" "
Fulton, Gordon R.	IVb	Lawrence "
Ganley, Charles A.	VIa	Lowell, "
Garnett, Stanley I.	IVa	" "
Garvey, Daniel H.	I	" "
Gaudette, Emery J.	VIa	" "
Gauthier, George W.	VIa	" "
Genakos, Sarantos G.	I	" "
Giffin, William J.	III	" "
Gillis, Frederick J.	VIa	" "
Giroux, Arthur	VIa	" "
Glennon, Edward M.	IVb	Lawrence, "
Godbout, Marjorie J., Jr.	VIa	Lowell, "
Goodwin, Ross	Vb	" "
Gordon, Loyd H.	VIa	" "
Gordon, William	VIa	Andover, "
Gorman, William E.	VIa	Lowell, "
Grand, Charles J.	I	" "
Grantham, Charles V.	VIa	" "
Gregoire, Henry	VIa	" "
Grouke, John	Vb	" "
Guiney, John P.	IVa	" "
Hagan, James	Vb	" "
Hall, Harry D.	VIa	" "
Hamilton, Herbert	VIa	Lawrence, "
Hamilton, William J., Jr.	Va	Lowell, "
Handley, John M.	Vb	" "
Hanley, Edward T.	IIb	Forge Village, "
Hannagan, Edward F.	IIb	Lawrence, "
Hansen, Hans M.	VIe	Lowell, "
Hanslip, Charles W.	Vb	Collinsville, "
Hanson, Edward	I	Lowell, "
Harrall, William	VIa	" "
Harrison, Claude F.	Vb	" "
Harrison, Fred N.	VIa	" "
Harrison, Henry H.	IVa	" "
Hartley, Thomas L.	IVa	" "
Hartshorn, George T.	IVa	" "
Hartwell, Marcus H.	Va	" "
Haynes, Arnold P.	IIa	" "
Hennessey, John A.	VIa	" "
Hennessey, Michael T.	VIb	" "
Herlihy, John F.	VIa	" "
Herrick, William E.	VII	Dracut, "
Herron, Alexander T.	IVa	Lawrence, "
Hession, James J.	VIa	Lowell, "
Hibbert, George E.	Vc	" "

Name	Course	Address
Higgins, Alfred	III	Lawrence, Mass.
Hildreth, Arthur	IVa	Lowell, "
Hill, Harold	IIb	Methuen, "
Hill, William L.	I	Lowell, "
Hinchliff, Ralph	I	" "
Hinchliffe, Thomas P.	I	" "
Hird, James A.	IVd	" "
Hoelzel, Louis C.	VIa	Lawrence, "
Holland, John	VIb	Lowell, "
Holmes, Otis M.	I	Haverhill, "
Holt, Gavin O.	IVd	Lowell, "
Howard, Francis W.	VIa	" "
Howker, John	VIa	" "
Hubbard, Ralph K.	IIa	" "
Huntley, Nelson H.	VIa	" "
Huntly, Joseph	VIb	" "
Ingham, Horace	VIa	" "
Jackson, Ernest E.	III	Methuen, "
Jackson, Frank	VIa-e	" "
Jean, Amedee E.	VIa	Lowell, "
Jefferson, Pauline C.	VIId	" "
Johnson, Henry	IIb	" "
Johnson, H. Craig,	VIa	" "
Johnson, Henry L.	VIa	" "
Jordan, Frederic W.	VIa	" "
Jowett, William H.	IIa	Methuen, "
Jutras, Adelard G.	IIb	Lowell, "
Kelliher, Cornelius	VIa	" "
Kendrick, John A.	VIa	" "
Kenney, William M.	III	" "
Keough, Wesley L.	IVa	" "
Kershaw, Benn	III	" "
Kershaw, James	VIa	" "
Kiernan, Thomas	VIe	" "
King, John	VIa	" "
King, John F.	VIa	" "
Kinghorn, James W. G.	VIa	" "
Knight, Fred E.	VIa	Lawrence, "
Kyriacopoulos, John A.	VIa	Lowell, "
Lackberg, John L.	VIe	" "
Laforest, Alfred	VIId	" "
Laforest, John	VIId	" "
LaJeunesse, Joseph A.	IVc	" "
Lamarre, Edgar J.	VIa	" "
Lambert, Seth	IIb	Methuen, "
Lambert, Severe	VIb	Lowell, "
Lane, Maurice J.	I	Lawrence, "
Lang, William A.	VIa	Lowell, "
Laporte, Philip J.	IVa	" "
Lareau, Charles E.	VIb	" "
Leavitt, John F.	IVa	" "
LeClair, Joseph E.	I	" "
Leech, Joseph	VIb	" "
LeLacheur, Paul J.	VIId	" "
Leman, George	IIb	North Chelmsford, "
Lemire, Arthur	Va	Lowell, "

Name	Course	Address
Lemire, Mederick	VIa	Lowell, Mass.
Lesure, Carl H.	VIa	Lawrence, "
Lewis, Charles	VIa	Lowell, "
Lhussier, Fred	IIb	North Chelmsford, "
Linberg, Carl	IIb	Jamaica Plain, "
Lindsay, Clarence D.	IIb	Andover, "
Lockwood, James	VIb	Lawrence, "
Lord, Wilfred H.	VIa	Lowell, "
Lussier, Hervy	VIa	" "
Lussier, Theodore F.	VIa	" "
Lynch, Francis R.	IVa	Lawrence, "
Lynch, Patrick A.	III	Lowell, "
Lyness, Charles	Vb	" "
Lyons, John A.	VIa	" "
Mabbett, Albert L.	VII	Collinsville, "
Mahoney, James A.	VIa	Lawrence, "
Malley, Edward F.	VIa	" "
Manning, James B.	IVb	Lowell, "
Mansfield, William F.	VIa	" "
Marcotte, Charles	VIa	" "
Martakos, Sophos	Va	" "
Martin, Joseph J.	VIId	" "
Masse, Flora D.	VIId	" "
Maynard, Wilfred B.	IIa	" "
Mayo, Fred R.	IVa	" "
McCarthy, John P.	VIa	" "
McClure, John	IIb	North Chelmsford, "
McComb, Albert J.	VIa	" "
McCool, Frank L.	IIa	Lowell, "
McCune, Lawrence B.	VIa	" "
McDonald, John F.	VIa	" "
McDonald, William A.	VIb	" "
McDowell, James	I	" "
McDowell, Thomas	I	" "
McEvoy, Leo F.	VIId	" "
McGee, David	IVa	" "
McGowan, Annie C.	III-VId	" "
McGurn, James P.	VIa	" "
McInnis, Edward W.	VIa	" "
McKenna, Frank	VIa	" "
McKenzie, William B.	IVa	" "
McMahon, Edward F.	VIe	" "
McNamara, Thomas	Vb	" "
McOsker, James F.	VIa	" "
McOsker, John J.	VIa	" "
McQuade, John A.	VIe	" "
Metcalfe, Walter B.	IIb	North Chelmsford, "
Michael, Joseph M.	Vb	Lowell, "
Michaud, Joseph E.	Vb	" "
Millea, William D.	VIb	Lawrence, "
Minis, Carol E.	I	Lowell, "
Molloy, Michael A.	VIa	" "
Morin, Joseph A.	VIa	" "
Morin, Peter	III	" "
Morley, Ernest C.	IIb	Methuen, "
Morris, James	I	Lowell, "

Name	Course	Address
Moss, John S.	VIa	Lowell, Mass.
Mountain, Everett R.	VIa	" "
Mowatt, John	VIa	" "
Mullen, Albert R.	IIb	" "
Mullen, Francis J.	VIa	" "
Muller, Otto H.	IIb	" "
Mulligan, John J.	VIa	" "
Mullin, John F.	I	" "
Murphy, Joseph H.	IVa	Lawrence, "
Murphy, Leo T.	III	Lowell, "
Murray, Walter J.	VIa	" "
Murray, William H.	VIa	" "
Naylor, Fred	IIb	Forge Village, "
Needham, Frank G.	III	Lowell, "
Nelson, Gustaf A.	III	" "
Ness, Alexander M.	VIa	Andover, "
Newell, Preston	I	Lowell, "
Nicoll, Claude	VIb	Andover, "
Nicoll, John	IVb	" "
O'Brien, Augustine J.	VIa	Lawrence, "
O'Brien, John	III	Lowell, "
Oertelt, Jean O. F.	VIa	" "
Ogden, Albert	Vb	" "
O'Loughlin, Edward	VIa	" "
O'Malley, John M.	IVa	" "
Page, Eugene O.	VIa	" "
Paquin, Noella	VIa	" "
Parkin, Prescott R.	Vb	" "
Parkin, Walter	IIb	" "
Parkinson, Thomas	I	" "
Pascall, Arthur F.	IIb	" "
Patrick, James	Vb	" "
Perham, Charles F.	III	" "
Perron, Francis J.	Vb	North Andover, "
Petterson, Birger	VIa	Lowell, "
Picard, George J.	VIb	" "
Pickles, William	IIb	" "
Pihl, Ingrid I.	VIa	" "
Platin, John V.	VIa	" "
Polley, Alvin H.	VIb	" "
Pope, Walter C.	VIa	" "
Potter, Joseph H.	IIb	" "
Precious, Walter	IIb	Forge Village, "
Randall, William O.	IIa	Lawrence, "
Reese, Anthony B.	III	Wellesley Hills, "
Ricard, Eugene G.	III	Lowell, "
Riley, Philip A.	VIa	" "
Riley, Thomas J.	IVa	North Billerica, "
Ritchie, John J.	VIb	" "
Roarke, Edward H.	VII	Lowell, "
Roarke, Frank J.	VIa	" "
Roberts, David G.	IIb	Methuen, "
Robinson, Ethel G.	VIa	Lowell, "
Robinson, James E.	VII	" "
Robinson, Ruddach P.	III-VII	" "
Robinson, William A.	III-VII	Lawrence, "

Name	Course	Address
Rochette, Joseph E.	III	Lowell, Mass.
Rollins, Sidney R.	IIb	Lawrence, "
Rowlands, Harold	Va	Needham, "
Royds, James	I	Lowell, "
Rutter, Earle R.	IVa	Lawrence, "
St. Onge, Emma	VIa	Lowell, "
Salamone, Alfio	Va	" "
Salome, Joseph R.	Va	" "
Sargent, Charles E.	III	" "
Savage, Thomas R.	VIb	" "
Sawyer, Florence	VIa	" "
Scanlon, David C.	I	" "
Schofield, James	III	" "
Scully, John	VIe	" "
Sewell, James R. G.	III	Lawrence, "
Shanahan, Edward F.	Vb	Lowell, "
Shannon, Thomas F.	VIa	" "
Shaughnessy, John J.	VIa	" "
Shaw, Albert	VIb	" "
Shaw, Harold W.	I	" "
Shaw, Stewart J.	VIa	" "
Shaw, William	VIa	" "
Shea, William F.	VIe	" "
Shields, John J.	Va	" "
Shunny, John R.	VIb	" "
Silcox, Walter G.	VIa	" "
Sleeper, Frederick G.	I	" "
Small, Lester E.	III	Lawrence, "
Smith, Albert H.	III	Methuen, "
Smith, James A. C.	III	Lowell, "
Smith, Walter H.	VIa	" "
Soulard, Edmond	IIa	Dracut, "
Soulard, Eugene	VIa	" "
Soule, William N.	VIe	Lowell, "
Sousa, Andrew P.	VIa	" "
Sparks, John J.	VIa	" "
Spillane, John R.	Vb	" "
Stewart, George	Va	" "
Stewart, William W.	I	Lawrence, "
Stockton, Thomas	VIa	Lowell, "
Stott, Bertram S.	III	Andover, "
Stringer, Thomas C.	VIa-e	Lawrence, "
Stuart, Merton	VIa	Lowell, "
Sullivan, John J.	IVa	" "
Sullivan, Michael F.	VIa	Dracut, "
Sweatt, Lewis M., Jr.	VIa	Lowell, "
Sweeney, James A.	VIa	" "
Taisey, Claude E.	VIa	" "
Talbot, Sarphiels J.	IIb	North Chelmsford, "
Tarbox, Frank E.	III	West Lynn, "
Tarren, William	IIb	Lawrence, "
Taylor, Carl W.	I	Lowell, "
Teal, Irving	VIa	" "
Tellier, Herman J.	VIe	" "
Tellier, Leo E.	VIa	" "
Templeton, Guy C.	VII	" "

Name	Course	Address
Thomas, Cyril	IIb	Lawrence, Mass.
Thomas, Reginald	IIb	" "
Thresh, Frank R.	VIa	" "
Todd, Henry	III	Andover, "
Towers, Frederic G.	I	Lawrence, "
Towle, Herbert J.	VIa	" "
Tucke, Edward D., Jr.	VIa	Lowell, "
Tucker, John T.	III	" "
Tucker, Walter E.	Va	" "
Tulley, Bernard A.	IVa	" "
Twomey, Hugh	VIa	" "
Unsworth, Stephen	VIIb	" "
Valentine, William D.	VIa	Andover, "
Vaughan, Myrtie F.	VIa	Lowell, "
Vigeant, Leo A.	VIa	" "
Vilezis, George M.	Va	" "
Vogel, Hermann R.	III-Vc	Lawrence, "
Wade, Frank J.	Vb	Lowell, "
Wagner, Gustave A.	IVa	Lawrence, "
Wakefield, Howard E.	IVa	Lowell, "
Walton, Frank L.	I	" "
Waterworth, Nathan J.	VIe	" "
Webb, Ralph S.	VIa	" "
Webster, Archie W.	VIa	" "
Webster, Orrin H.	I	" "
Welch, James A.	VIa	" "
Westover, Edmund	VId	" "
Whatmough, James H.	III	" "
Whelton, George B.	VIa	" "
Whiteside, Joseph	Va	" "
Whitman, William P.	IVb	" "
Whittier, Harold F.	VIIb	" "
Whitworth, Jesse	IVa	" "
Wickens, Harold S.	IVa	Lawrence, "
Wiggins, Fred E.	VIIb	Lowell, "
Williams, Allen R.	Va	" "
Williams, Clarence M.	VIa	" "
Wilson, Percy L.	III	" "
Winslow, Warren A.	IIa	Ayer, "
Wiswall, Frank T.	IIb	Lawrence, "
Wollin, Frederick W.	Va	Lowell, "
Wood, William H.	VIIb	" "
Woodman, Cyrus	III	" "
Woodward, Ernest C.	I	" "
Worthington, John A.	Va	" "
Wright, Frederick J.	Vb	" "
Wright, Harold J.	Vb	" "
Yeadon, Bernard W.	III	" "

SUMMARY

Day Students	231
Evening Students	619
Total	850
Names counted twice	45
Net Total	805

ALPHABETICAL REGISTER OF GRADUATES

Name	Course	Class	Day or Evening
Abbott, Edward M.	II	1904	D
Abbott, George R.	II	1908	D
Abbott, Paul W.	I	1906	E
Ackroyd, Theodore C.	IIb	1907	E
Adams, Henry S.	IIa	1903	E
Adams, Henry S.	I	1905	D
Adams, Michael E.	VI	1904	E
Adams, William R.	IIa	1902	E
Amiot, Louis H.	Va	1906	E
Anderson, Carl A.	IV	1909	E
Anderton, Harry	Va	1910	E
Arienti, Peter J.	IV	1910	D
Armstrong, Elias B.	IIb	1906	E
Arnold, Warren H.	VII	1908	E
Arnold, Warren H.	III	1909	E
Arundale, Henry B.	II-III-V	1905	D
Arundale, Henry B.	II	1907	D
Aspinwall, William	IIb	1901	E
Atkinson, Norman	Vb	1910	E
Avery, Charles H.	II	1906	D
Bailey, Carl E.	I	1910	E
Bailey, Joseph W.	I	1899	D
Bailey, Rothwell	Va	1909	E
Bain, William A.	VII	1907	E
Bake, Herbert	III	1905	E
Bake, Herbert	P. G. III	1906	E
Bake, Herbert	VII	1907	E
Bake, Herbert	P. G. III	1909	E
Baldwin, Arthur L.	IV	1900	D
Baldwin, Frederick A.	II	1904	D
Ballard, Horace W. C. S.	IV	1908	D
Ballinger, Frederick W.	IIb	1907	E
Balmforth, James H.	IIa	1903	E
Balmforth, James H.	IIa-b	1904	E
Balmforth, William F.	VI	1904	E
Balmforth, Martha B. (See French)			
Banks, Jonas	Va	1909	E
Banks, Jonas	Vc	1910	E
Barber, James E.	IIb	1907	E
Barker, John P.	V	1904	E
Barlow, Robert	V	1902	E
Barr, I. Walwin	I	1900	D
Barraclough, John C.	I	1907	D
Barrington, James L.	IV	1908	E
Barrington, John A.	IV	1904	E
Barry, Edward J.	III	1903	E
Bastow, Henry	III	1903	E
Bastow, Henry	V	1905	E
Bastow, Stephen W.	IV	1907	E
Baxter, Alvah J.	IIa	1903	E
Bayard, Pierre P.	III	1907	E
Begen, Thomas W.	IIb	1907	E
Begen, Thomas W.	IIb	1908	E
Bell, Frederick W.	IIa	1905	E

Name	Course	Class	Day or Evening
Bennett, Edward H.	V	1903	D
Benoit, Benjamin L.	VIb	1909	E
Benoit, William A.	Va	1907	E
Berry, Alfred H.	VI	1908	E
*Berry, Frank M.	III	1899	E
*Berry, Frank M.	V	1901	E
Berry, Percy W.	Vb	1910	E
Binns, Heaton	II-V	1899	E
Binns, Heaton	VI	1902	E
Bloom, Wilfred N.	IV	1903	D
Bodwell, Henry A.	II	1900	D
Booth, Arthur	III	1909	E
Boucher, John L.	VI	1904	E
Bouille, Arthur L.	Vb	1907	E
Bourchard, Ethan J.	Vc	1910	E
Bourchard, Robert R.	Vb	1910	E
Bowen, Herbert E.	III	1909	E
Bowie, Samuel A.	VI	1905	E
Bowring, George P. B.	VI	1902	E
Boyd, George A.	I	1905	D
Bradford, Roy H.	II	1906	D
Bradley, Richard H.	V	1901	D
Brainerd, Arthur T.	IV	1909	D
Brainerd, Irving L.	I	1902	E
Brannen, Leon V.	III-V	1907	D
Brannen, Leon V.	IIa	1907	E
Brickett, Chauncey J.	II	1900	D
Broadbent, James H.	Vb	1908	E
Broadbent, James T.	I	1899	E
Broadbent, William	Vb	1908	E
Brooks, Noah	III-V	1901	E
Brouder, John J.	III	1906	E
Brouder, John J.	VII	1907	E
Brown, James P.	III	1905	E
Brown, James P.	P. G. III	1906	E
Brown, James T.	III	1908	E
Brown, William G.	IIb	1906	E
Bryant, Ernest L.	VI	1905	E
Buchan, Donald C.	II	1901	D
Buckley, Harry	IV	1908	E
Buckley, Richard A.	Vb	1909	E
Bucklitsch, Gustave J.	IIb	1907	E
Bunce, Raymond H.	Vb	1909	E
Burgess, Joseph H.	Va	1906	E
Burgess, Joseph H.	Vb	1907	E
Burgess, Joseph H.	III	1910	E
Burghardt, Edward S.	IIa	1902	E
Burghardt, Paul C.	IIa	1901	E
Burke, Thomas F.	I	1905	E
Burnham, Frank E.	IV	1902	D
Burnham, Joseph W.	III	1906	E
Burnham, Wilmont V.	Vb	1906	E
Burns, Edward J.	IV	1905	E
Burns, James E.	IV	1905	E
Burrage, Katherine C.	IIIb	1899	D

*Deceased

Name	Course	Class	Day or Evening
Burridge, Katherine C.	P. G. IIIb	1900	D
Butler, Benjamin O.	VI	1904	E
Butler, Elizabeth M.	VI d	1909	E
Butterworth, Charles A.	Va	1907	E
Butterworth, John A.	IIb	1907	E
Buzzell, William O.	III	1901	E
Buzzell, William O.	P. G. III	1902	E
Byam, Walter S.	VI	1903	E
Cady, Dennis J.	V	1903	E
Callahan, Patrick A.	VI	1904	E
Campbell, Albert D.	IIb	1900	E
Campbell, Archibald	IV	1908	E
Campbell, Edward G.	VIc	1910	E
Campbell, Laura E.	IIIb	1900	D
Campbell, Louise P.	IIIb	1903	D
Campbell, Orison S.	II	1903	D
Carden, Francis E.	IIb	1907	E
Carden, Francis E.	IIb	1908	E
Carlson, Ernest B.	IIb	1907	E
Carman, William	Va	1909	E
Carney, William J.	I	1908	E
Caron, Cleophas	I	1905	E
Carr, George E.	I	1905	D
Carter, Charles R.	Vb	1908	E
Carter, Robert A.	IV	1902	D
Cary, Julian C.	VI	1910	D
Cawthra, Albert B.	IIb	1900	E
Chamberlin, Frederick E.	I	1903	D
Cheetham, John James	III	1901	E
Cheetham, John James	P. G. III	1902	E
Cheetham, John Joseph	I	1904	E
Chesworth, Frank K.	Va	1909	E
Chippindale, Ernest W.	IIb	1901	E
Christison, Hugh	IV	1910	E
Church, Charles R.	II-V	1906	D
Churchill, Charles W.	III	1906	D
Clapp, F. Austin	II	1904	D
Clark, Thomas T.	II	1910	D
Clogston, Raymond B.	IV	1904	D
Cockell, Frederick H.	III	1909	E
Colby, Arthur D.	I	1900	E
Cole, Edward E.	IV	1906	D
Cole, James T.	II	1905	D
Collier, John	III	1899	E
Collier, John	P. G. III	1902	E
Collins, John A.	IIa-b	1905	E
Coman, James G.	I	1907	D
Conant, Harold W.	I	1909	D
Conklin, Jennie G.	IIIb	1905	D
Conley, Frederick A.	VI	1904	E
Connors, Edward F.	VI	1904	E
Cook, Cheney E.	III	1905	E
Corr, Eben W.	Vb	1908	E
Corr, James F.	Vb	1908	E
Cowdell, Herbert	V	1901	E
Cowdrey, Charles E.	V	1902	E

Name	Course	Class	Day or Evening
Cowdrey, Charles E.	Vb	1909	E
Cox, Edward J.	III	1910	E
Craig, Albert W.	IV	1907	D
Craig, Clarence E.	III	1902	D
Craven, Harry	VII	1908	E
Cremin, Daniel J.	I	1902	E
Crompton, Henry H.	II	1899	E
Culver, Ralph F.	IV	1904	D
Curran, Charles E.	II-III-V	1902	D
Currier, Herbert A.	I	1906	D
Currier, John A.	II	1901	D
Curtis, Frank M.	I	1906	D
Curtis, William L.	II	1905	D
Custer, James J. E.	V	1905	E
Cutler, Benjamin W., Jr.	III	1904	D
Cutress, Albert J.	VIe	1910	E
Cuttle, James H.	II	1899	D
Dana, Clarence A.	VI	1905	E
Davis, Henry	IIb	1901	E
Davis, Prentice T.	I	1904	E
Davison, Frank L.	Vb	1909	E
Deely, John A.	Vb	1910	E
Delmage, Edward R.	III	1904	E
Dempsey, John W.	IIa	1904	E
Dewey, James F.	II	1904	D
Dick, Hugo P.	III	1905	E
Dick, Hugo P.	P. G. III	1906	E
Dick, Hugo P.	IIb	1907	E
Dick, Hugo P.	Vb	1908	E
Dickson, Andrew	IIa	1906	E
Dillon, James H.	III	1905	D
Dimlick, Benjamin C.	III	1905	E
Dimlick, Benjamin C.	P. G. III	1906	E
Dixon, Arthur	III	1908	E
Dobbs, Willie	IIb	1907	E
Dobbs, Willie	IIb	1908	E
Dodge, Charles P.	IIa	1907	E
Dodge, Frank	I	1906	E
Donahue, Michael F.	VI	1904	E
Donald, Albert E.	II	1904	D
Donnellan, Frank T.	IIa	1902	E
Donnellan, Frank T.	V	1903	E
Donnelly, James	I	1900	E
Donovan, Daniel F.	IIa	1901	E
Doole, George L.	VI	1904	E
Dooley, Edward W.	VI	1904	E
Duce, Benjamin	III	1906	E
Duce, Benjamin	VII	1907	E
Duckett, Fred I.	Vb	1910	E
Dudley, George E.	I	1902	E
Duggan, Francis P.	VI	1904	E
Dulligan, Charles E.	VIa	1909	E
Dulligan, Lawrence F.	VIa	1910	E
Dunn, George C.	III	1908	E
Dunn, George C.	IVa	1910	E
Dunning, Carlos W.	VIIb	1909	E

Name	Course	Class	Day or Evening
Duval, Joseph E.	II	1910	D
Dwight, John F., Jr.	II	1908	D
Ehrenfried, Jacob B.	II-V	1907	D
Eklund, Louis V.	Vb	1910	E
Ellis, George W.	VII	1906	E
Elston, Fred R.	III	1900	E
Emerson, Frank W.	II	1903	D
Erbe, Gustave	VI	1905	E
Evans, Alfred W.	III	1903	D
Evans, William R.	III	1903	D
Evison, William A.	V	1901	E
Ewer, Nathaniel T.	IV	1901	D
Eyers, John T.	IV	1906	E
Fairbanks, Almonte H.	II	1909	D
Farmer, Chester J.	IV	1907	D
Farr, Leonard S.	II	1908	D
Farrell, Thomas	IIa	1901	E
Fels, August B.	II	1899	D
Ferguson, Arthur F.	I	1902	D
Ferguson, Arthur F.	I	1903	D
Ferguson, Thomas	V	1902	E
Ferguson, William G.	III	1909	D
Field, Charles W.	VI	1902	E
Fielding, Fred	Vc	1910	E
Finlay, Harry F.	IV	1910	D
Fiske, Starr H.	II	1909	D
Fleming, Frank E.	IV	1906	D
Flemings, Lester A.	Va	1910	E
Fletcher, Roland H.	VI	1910	D
Flint, Leon G.	III	1907	E
Flynn, John	VIe	1910	E
Flynn, John J.	VI	1903	E
Flynn, Patrick	Vb	1910	E
Flynn, William J.	Vb	1908	E
Forrest, Fred G.	IIa	1902	E
Fortune, David A.	IIb	1902	E
Foster, Clifford E.	II	1901	D
Foster, Sherwood L.	I	1905	E
Frame, William	V	1901	E
Frank, Emil M.	III	1904	E
Frank, Emil M.	P. G. III	1906	E
Frechette, Alphonse J.	IIb	1907	E
French, Ernest J.	I	1905	E
French, Martha Balmforth	III	1903	E
Fujiyoshi, Heisayu	I	1910	E
Fuller, George	I	1903	D
Fuller, John M.	V	1906	E
Gagan, John H.	V	1901	E
Gahm, George L.	II	1906	D
Gale, Harry L.	III	1910	D
Garner, William	III	1903	E
Gaspar, Edith E.	VId	1910	E
Gaunt, Alfred C.	III	1899	E
Gaunt, Alfred C.	P. G. III	1902	E
Gaunt, Alfred C.	IIa	1903	E
Gaunt, Alfred C.	IIb	1904	E

Name	Course	Class	Day or Evening
Gaunt, Ernest H.	III	1909	E
Gauthier, William	Vb	1910	E
Gay, Earle B.	I	1905	E
Gay, Olin D.	II	1908	D
Gerrish, Walter	III	1903	D
Gilinson, Philip J.	VIa	1909	E
Gillispie, James E.	VII	1907	E
Gillon, Sarah A.	IIIb	1906	D
Goldberg, George	VI	1910	D
Good, Henry	I	1902	E
Goodchild, George	I	1903	E
Goodchild, George	VI	1905	E
Goodhue, Amy H. (See Harrison)			
Gookin, Alice L.	VIa	1910	E
Gordon, Herbert E.	III	1909	E
Grant, Archibald	IIb	1901	E
Gray, Finley M.	VI	1903	E
Greenhalge, James	Vc	1908	E
Gregson, Robert B.	Va	1906	E
Gregson, Robert B.	I-Vc	1907	E
Grouke, Michael	IIb	1901	E
Gyzander, Arne K.	IV	1909	D
Haartz, John C.	VII	1907	E
Haas, Ignatius	I	1907	E
Hadley, Walter E.	IV	1908	D
Haigh, Walter	III	1902	E
Haigh, William	Vb	1906	E
Hallbauer, William R.	Vb	1908	E
Halsell, Elam R.	I	1904	D
Hamblett, Harry A.	I	1907	E
Hanglin, Albert J.	IV	1907	E
Hanglin, William E.	Vb	1907	E
Hanson, Edward	III	1908	E
Hanson, Edward	P. G. III	1909	E
Harder, Elmer E.	VI	1905	E
Hardman, David B.	IV	1908	E
Hardy, Philip L.	VI	1910	D
Harmon, Charles F.	I	1899	D
Harris, Charles E.	I	1905	D
Harris, George S.	I	1902	D
Harris, Louis	VII	1908	E
Harrison, Amy Goodhue	IIIb	1900	D
Harrison, Amy Goodhue	P. G. IIIb	1901	D
Hartwell, Henry E.	VI	1906	E
Haskell, Spencer H.	II	1907	D
Haskell, Walter F.	IV	1902	D
Hathorn, George W.	IV	1907	D
Haven, George W.	III	1905	E
Haworth, Joseph	VI	1902	E
Hayes, Michael C.	IIa	1909	E
Hebert, Charles L. J.	IV	1907	E
Hempel, Frank	V	1904	E
Hennessey, Ambrose M.	VII	1908	E
Hennigan, Arthur J.	II	1906	D
Hering, Paul C.	III	1910	E
Hibbert, George E.	Va	1910	E

Name	Course	Class	Day or Evening
Higgins, James A.	IIa	1903	E
Higgins, James A.	IIa-b	1904	E
Hildreth, Harold W.	II-V	1906	D
Hildreth, Harold W.	II	1907	D
Hill, Daniel	IIb	1901	E
Hill, Ellsworth O. C.	IIb	1910	E
Hill, Harold	I	1908	E
Hill, Harold	Va	1909	E
Hilliard, William B.	VIa	1910	E
Hillier, Arthur P.	IIb	1909	E
Hintze, Thomas F.	I	1906	D
Hird, Arthur W.	I	1910	E
Hird, James A.	IVa	1910	E
Hitchcock, Thomas B.	I-IIa-III	1901	E
Hitchen, Harry S.	Vb	1907	E
Hitchen, Thomas G.	Vb	1907	E
Hodgkins, Albert A.	VII	1909	E
Hodgkins, Albert A.	III	1910	E
Hoellrich, Martin J.	Vb	1908	E
Hoellrich, Martin J.	Vc	1910	E
Hoessler, Carl, Jr.	III	1906	E
Hogan, James A.	V	1902	E
Holden, Francis C.	IV	1909	D
Holgate, Benjamin	III	1902	D
Holgate, Benjamin	V	1903	D
Holgate, Charles H.	IIa	1901	E
Hollings, James L.	I	1905	D
Holt, Gavin O.	IVa	1910	E
Holt, Harry C.	VIa	1909	E
Hook, Russell W.	IV	1905	D
Horsfall, George G.	II-III-V	1904	D
Houston, William I.	III	1909	E
Houston, William I.	Vb	1910	E
Howard, John	V	1900	E
Howard, John	III	1903	E
Howard, John	IIa	1906	E
Howard, John	VII	1907	E
Howard, Thomas	V	1905	E
Howe, Woodbury K.	I	1910	D
Howell, Edward A.	Va	1909	E
Hoyle, Edward	IIb	1902	E
Hoyle, Joseph	IIb	1904	E
Hoyt, Charles W. H.	IV	1907	D
Huising, Geronimo H.	I	1908	D
Hunt, Chester L.	III	1905	D
Hunt, Herbert R.	VI	1905	E
Hunter, Ralph	III	1901	E
Hunter, Ralph	V	1903	E
Hunton, John H.	VII	1910	E
Hunton, Lewis G.	IV	1905	E
Hurtado, Leopoldo, Jr.	Vc	1910	E
Hurtado, Leopoldo, Jr.	IV	1910	D
Hutton, Clarence	V	1900	E
Hutton, Clarence	III	1903	D
Hutton, Harold	V	1906	E
Hutton, John M.	Vb	1906	E

Name	Course	Class	Day or Evening
Hutton, Thomas V.	Vb	1910	E
Ignatius, Pentti	Va	1907	E
Inberg, Magnus	I	1906	E
Ingham, Benjamin W.	I	1908	E
Jackson, Frank	VIb	1910	E
Jean, Adhemard C.	VIa	1910	E
Jeannotte, Arthur	VI	1904	E
Jelleme, William O.	I	1910	D
Jenckes, Leland A.	VI	1908	D
Jennings, James J.	III	1903	E
Jepson, Harry	Vb	1907	E
Johnson, Ernest A.	IIa-b	1902	E
Johnson, Ernest A.	V	1906	E
Johnson, Samuel L.	V	1903	E
Jones, Everett A.	II	1904	D
Jones, Everett A.	III	1905	D
Jones, William J.	IIb	1900	E
Jones, William J.	IIa	1901	E
Jordan, Frederic W.	IV	1910	E
Jorde, Linville T.	VIc	1910	E
Joyce, John	Vc	1909	E
Jury, Alfred E.	IV	1904	D
Kaler, Harold F.	VIb	1909	E
Kay, Harry P.	II	1909	D
Keleher, John J.	IIb	1903	E
Kellett, Irvine	II	1899	E
Kelley, Bernard J., Jr.	VIc	1909	E
Kelley, Michael H.	I	1902	E
Kelley, Michael H.	III	1907	E
Kent, Clarence L.	III-V	1906	D
Kent, Ernest J.	IIb	1902	E
Kenworthy, Joseph	I	1905	E
Keough, Wesley L.	II	1910	D
Kershaw, Benn	Va	1909	E
Kershaw, Benn	Vc	1910	E
Kershaw, Samuel S.	IIb	1910	E
Kershaw, William E.	V	1904	E
Kidd, Thomas E.	IV	1906	E
Killerby, Walter	IIb	1901	E
Kimball, Irving D.	VI	1905	E
Kingsbury, Percy F.	IV	1901	D
Kirsch, Alfred O.	Vb	1907	E
Knowland, Daniel P.	IV	1907	D
Knowles, Frank E.	I	1903	E
Krause, George	VII	1910	E
Laffert, August W.	III	1906	E
Laffert, August W.	VII	1907	E
Lagerblad, Jarl	VII	1908	E
LaJeunesse, Joseph A.	IVa	1910	E
Lake, William F.	III	1907	E
Lake, William F.	P. G. III	1908	E
Lakeman, Fannie S.	IIIb	1900	D
Lamb, Arthur F.	II	1910	D
Lamont, Walter M.	IIb	1902	E
Lamson, George F.	I	1900	D
Lamson, George F.	VI	1905	E

Name	Course	Class	Day or Evening
Lane, John W.	I	1906	D
Lane, John W.	I-V	1907	D
Langevin, Felix D.	VI	1904	E
Laughlin, James K.	III	1909	D
Law, Alfred	IIb	1901	E
Lawliss, Augustine J.	V	1902	E
Lawrence, Charles	I	1903	E
Leach, John P.	I-V	1900	D
Leach, Joseph W.	V	1903	E
Leck, Arthur J.	VII	1910	E
Ledoux, Blanche H.	VIId	1910	E
Lee, Charles	I	1902	E
Lee, William H.	V	1905	D
Leith, Edwin E.	III	1902	E
Lemire, Arthur	I	1910	E
Levi, Alfred S.	IV	1909	D
Lewis, LeRoy C.	IV	1908	D
Lewis, Walter S.	IV	1905	D
Libby, C. Robert	VI	1902	E
Lincourt, Hector L.	VI	1903	E
Lincourt, Henry E.	VIb	1909	E
Linkletter, Alfred C.	VI	1905	E
Lord, Harry D.	III	1904	E
Lord, Wilfred	III	1901	E
Lord, Wilfred	IIb	1903	E
Lord, Wilfred	IIa	1904	E
Lovell, Charles E.	VI	1905	E
Lucey, Edmund A.	II	1904	D
Mabbett, Albert L.	III	1910	E
Mackay, Stewart	III	1907	D
MacPherson, Wallace A.	III	1904	D
Madden, Peter	Va	1909	E
Maden, Harry	IIb	1900	E
Maguire, James H.	VI	1905	E
Maguire, James H.	I	1906	E
Mahoney, Dennis J.	Vb	1909	E
Mailey, Howard T.	II	1908	D
Maker, Isaac A.	I	1908	E
Manning, Frederick D.	IV	1910	D
Marjerison, Isaiah D.	II	1899	E
Marjerison, T. Sydney	III	1907	E
Marjerison, T. Sydney	P. G. III	1908	E
Marinel, Walter N.	I	1901	D
Marshall, Fred K. R.	VI	1908	E
Martin, John C., Jr.	IIa-b	1905	E
Martin, Willard E.	III	1907	E
Mason, Archibald L.	VI	1909	D
Mason, Frederick A.	I	1903	E
Maxcy, Leo M.	VIc	1910	E
McAlister, John W.	V	1899	E
McAuliffe, Patrick D.	VIb	1910	E
McBride, Robert G.	IIa	1904	E
McCarthy, Joseph F.	III	1906	E
McClure, Charles G.	VIb	1909	E
McCool, Frank L.	IV	1910	D
McDonnell, William H.	I-V	1906	D

Name	Course	Class	Day or Evening
McElroy, Samuel H.	Vb	1910	E
McGill, William E.	VII	1908	E
McGovern, James	VII	1908	E
McKenna, Hugh F.	IV	1905	D
McKenna, Jerimiah J.	Vb	1908	E
McLaughlin, Peter J.	I	1906	E
McLay, John	Vb	1906	E
McLay, John	IIb	1909	E
McManus, Hugh	V	1905	E
McQuade, Hugh B.	V	1901	E
Meadows, William R.	I	1904	D
Meek, Lotta (See Parker)			
Merchant, Edith C.	IIIb	1900	D
Merrill, Edwin C.	VI	1904	E
Merriman, Earl C.	II	1907	D
Messiah, Hiram G.	Vb	1910	E
Michelmores, Harry	III	1906	E
Michelmores, Harry	VII	1907	E
Midwood, Arnold J.	IV	1905	D
Miller, Emil H.	V	1904	E
Minge, Jackson C.	I-V	1901	D
Minge, Jackson C.	III	1901	E
Moir, Alexander L.	III	1899	E
Moir, Alexander L.	P. G. III	1903	E
Molloy, Andrew	V	1902	E
Molloy, Andrew	III	1905	E
Molloy, Andrew	P. G. III	1906	E
Molloy, Andrew	P. G. III	1909	E
Moore, Everett B.	I	1905	D
Moorehouse, Thomas	VI	1904	E
Moorhouse, William R.	IV	1901	D
Morris, Frank A.	V	1901	E
Morrison, Fred C.	I	1903	D
Mortenson, Carl W.	III	1903	E
Mortenson, Carl W.	IIa	1908	E
Morton, Albert N.	IIb	1906	E
*Mozley, Arthur	VI	1903	E
Mullen, Arthur T.	II	1909	D
Murphy, Cornelius D.	IIa	1906	E
Murphy, John H.	VI	1904	E
Murray, James A.	II	1910	D
Musard, Albert E., Jr.	Vc	1909	E
Myers, James W.	III-IV	1903	E
Myers, James W.	VII	1907	E
Najarian, Garabed	IV	1903	D
Nelson, Charles E.	IIb	1907	E
Nelson, Ernest H.	IIb	1900	E
Nelson, Ernest H.	IIa	1901	E
Nelson, Ernest H.	III	1906	E
Nelson, Ernest H.	I	1909	E
Nelson, Ernest H.	Vc	1910	E
Nelson, Gustave A.	Vb	1910	E
Newall, J. Douglas	IV	1909	D
Newcomb, Guy H.	IV	1906	D
Nichols, Clarence W.	Vb	1910	E

*Deceased

Name	Course	Class	Day or Evening
Nichols, Raymond E.	VI	1910	D
Nicholson, Richard	IIb	1903	E
Nicoll, John	IVa	1910	E
Noble, John T.	V	1899	E
Noble, John T.	III	1901	E
Noonan, Denis T.	III	1903	E
Notman, Frederick W.	I	1904	E
Nugent, Thomas A.	II-V	1899	E
Nugent, Thomas A.	VI	1902	E
Nutter, James R.	VI	1908	E
O'Brien, David A.	IV	1906	E
O'Brien, Michael F.	IIb	1907	E
O'Donnell, John D.	I	1904	D
Ogley, Samuel A.	IIb	1900	E
O'Hara, William F.	IV	1904	D
O'Neill, Peter F.	IV	1905	E
Orrell, Frank L.	VIb	1909	E
*Osbeck, William J.	III	1908	E
Osgood, Charles F.	I	1900	E
Osgood, Charles F.	VI	1902	E
Overend, John	V	1905	E
Palmer, G. Buel	III	1903	E
Palmer, G. Buel	Vb	1909	E
Paquin, Joseph	VIa	1909	E
Paquin, Joseph	VIb	1910	E
Parker, B. Moore	I	1901	D
Parker, Everett N.	I	1904	D
Parker, Everett N.	I	1905	D
Parker, Harry C.	V	1900	D
Parker, Lotta Meek	IIIb	1907	D
Parkis, William L.	I	1909	D
Parsons, Joseph G.	III	1909	E
Patrick, Alexander	III	1904	E
Patterson, Alfred H.	III	1908	E
Pearson, Fred	VIa	1909	E
Pease, Chester C.	I	1909	D
Pedler, William A.	I	1906	E
Peel, Hudson	IIb	1901	E
Perkins, John E.	III	1900	D
Perkins, J. Dean	III	1908	D
Perkins, Thomas, Jr.	I	1908	E
Petterson, Birger	VIa	1910	E
Petty, George E.	I-V	1903	D
Phelps, Mary I.	VIa	1910	D
Picken, William	III	1908	E
Pihl, Christian E.	VI	1906	E
Pittendreigh, John M.	I	1906	E
Plumer, Paul T.	Vb	1908	E
Porter, George K., Jr.	III	1907	E
Porter, George K., Jr.	P. G. III	1908	E
Potter, Carl H.	I	1909	D
Potter, Richard W.	V	1902	E
Pradel, Alois J.	III	1900	D
Pradel, Anna Walker	IIIb	1903	D
Preble, George A.	III	1908	E

*Deceased

Name	Course	Class	Day or Evening
Prescott, Walker F.	IV	1909	D
Prince, Sylvanus C.	VI	1908	D
Proctor, Braman	IV	1908	D
Putnam, Leverett N.	IV	1910	D
Ramsdell, Theodore E.	I	1902	D
*Rasche, William A.	III	1903	D
Raymond, Charles A.	IV	1907	D
Read, Paul A.	VII	1907	E
Read, Paul A.	Va	1909	E
Reardon, Timothy H.	VI	1906	E
Redman, Henry S.	III	1904	E
Redman, Henry S.	V	1905	E
Redman, Henry S.	I	1907	E
Redman, Henry S.	IV	1910	E
Reed, Foster C. K.	VI	1904	E
Reed, Norman B.	I	1910	D
Reynolds, Eugene A.	VI	1906	E
Reynolds, Fred B.	II	1908	D
Reynolds, Hiram L.	III	1901	E
Reynolds, Isabel H.	III-V	1903	D
Reynolds, Isabel H.	P. G. III-V	1906	D
Rhodes, Joseph E.	V	1904	E
Richards, Francis G.	IIa	1906	E
Ritter, Alfred E.	IIb	1907	E
Robbins, John	IIb	1907	E
Roberson, Pat H.	I	1905	D
Roberts, Carrie I.	IIIb	1905	D
Robinson, Ernest W.	IV	1908	D
Robinson, Thomas	I	1909	E
Robinson, Thomas	Vc	1910	E
Robinson, William C.	III-V	1903	D
Robson, Frederick W. C.	IV	1910	D
Rockwell, Henry D.	IIa	1903	E
Rockwell, Samuel F.	IIa	1902	E
Rooney, George W.	I	1904	E
Root, Francis X., Jr.	III	1910	E
*Rowell, Herman C.	I-IIb	1900	E
Rushworth, Walter	VI	1906	E
Ryan, Edward P.	I	1909	E
Saalfrank, Joseph C.	III	1908	E
Saunders, Edward B.	III	1901	E
Saunders, Harold F.	IV	1909	D
Sally, Edward	VI	1908	E
Scanlon, Edward J.	IIb	1901	E
Schermerhorn, George E.	I	1902	E
Schermerhorn, George E.	Va	1908	E
Schofield, John S.	III	1903	E
Schoon, Fenton	IIb	1903	E
Schubert, George J.	V	1906	E
Schubert, George J.	III	1909	E
Schuerfeld, Harry W.	III	1909	E
Schuster, William F.	VII	1908	E
Seddon, N. Graham	III	1908	E
Semple, Alexander	III	1908	E
Senior, George	Va	1906	E

*Deceased

Name	Course	Class	Day or Evening
Senior, George	I-Vc	1907	E
Shackelton, John H.	IV	1908	E
Shackleton, John H.	I	1910	E
Shannon, Philip J.	V	1901	E
Sharpe, John R.	VI	1906	E
Shaw, James	V	1904	E
Sheppard, Byron H.	VI	1906	E
Silcox, Arthur E.	I	1900	E
Silk, Frederick C. M.	IV	1905	E
Silk, Patrick E.	VII	1906	E
Simola, Emil J.	IIa-b	1905	E
Simoneau, Verner W.	VI	1908	E
Skinner, Clarence W.	III	1905	E
Skinner, Clarence W.	P. G. III	1906	E
Skinner, Clarence W.	VII	1907	E
Sleeper, Robert R.	IV	1900	D
*Smith, Albert A.	I	1899	D
Smith, Arthur	IaI	1905	E
Smith, Arthur	P. G. III	1906	E
Smith, Arthur	Va	1906	E
Smith, Arthur	Vc	1907	E
Smith, Arthur	P. G. III	1909	E
Smith, Doane W.	II	1910	D
Smith, Edward	I	1904	E
Smith, Ernest B.	Vb	1907	E
Smith, Fred	IIb	1901	E
Smith, George A.	III	1905	E
Smith, George A.	P. G. III	1906	E
Smith, George A.	VII	1909	E
Smith, James	Vb	1907	E
Smith, John W.	IIb	1904	E
Smith, Percy H.	Vb	1907	E
Smith, Ralston F.	I	1904	D
Smith, Stephen E.	I	1900	D
Smith, Theophilus G., Jr.	IV	1910	D
Smith, William E.	III	1905	E
Smith, William E.	P. G. III	1906	E
Smith, William E.	VII	1907	E
Smith, William E.	P. G. III	1909	E
Smith, William H.	IIb	1902	E
Snelling, Fred N.	II	1903	D
Snow, Fred L.	IV	1900	E
Spedding, Ephraim H.	III	1899	E
Spiegel, Edward	V	1903	D
Spurr, Albert R.	VII	1908	E
Spurr, James H., Jr.	IV	1908	E
Sterling, Walter	III	1904	E
Stevens, Dexter	I	1904	D
Stevens, Frank W.	VI	1905	E
Stevenson, Murray R.	III-V	1903	D
Stevenson, William	II	1899	E
Stevenson, William	III	1902	E
Stewart, Arthur A.	II	1900	D
Stewart, Charles	Va	1908	E
Stewart, Walter L.	III	1903	D

*Deceased

Name	Course	Class	Day or Evening
Stewart, William W.	IV	1910	E
Stockham, Burton I.	IV	1903	E
Stockham, Burton I.	P. G. IV	1904	E
Stocks, Carl W.	VIa	1909	E
Stohn, Alexander C.	III-V	1906	D
Stone, Ira A.	IV	1909	D
Stopherd, William H.	II-V	1899	E
Stopherd, William H.	VI	1902	E
Stopherd, William H.	III	1905	E
Stopherd, William H.	P. G. III	1906	E
Stopherd, William H.	P. G. III	1909	E
Stopherd, William H.	VII	1910	E
Storer, Francis E.	II	1907	D
Stott, Bertram S.	Vb	1910	E
Stott, Samuel	IV	1910	E
Stronach, Irving N.	IV	1910	D
Stursberg, Paul W.	II	1907	D
Sullivan, Humphrey F.	I	1909	E
Sullivan, Michael F.	VIb	1910	E
Swan, Guy C.	II	1906	D
Swift, Edward S.	V	1899	E
Swift, Edward S.	I	1901	E
Swift, Edward S.	I	1902	D
Sykes, Alvin E.	VIa	1909	E
Syme, James F.	II	1900	D
Tarpey, John F.	IIa	1904	E
Teichmann, Alfred A.	Vb	1908	E
Thomas, Roland V.	I	1905	D
Thompson, Charles B.	VI	1904	E
Thompson, Everett L.	I	1905	D
Thompson, Henry J.	IV	1900	D
Tilton, Elliott T.	II	1899	D
Todd, Henry	VII	1910	E
Tonge, John	IV	1905	E
Tonge, Matthew	III	1903	E
Toovey, Sidney E.	V	1904	D
Tucker, John T.	I	1908	E
Tucker, John T.	Va	1909	E
Umpleby, Thomas B.	V	1902	E
Upton, Frank A.	I	1903	E
Varney, Manley H.	III	1902	E
Varney, Manley H.	I	1903	E
Varnum, Arthur C.	II	1906	D
Varnum, Arthur C.	Vb	1907	E
Varnum, Arthur C.	P. G. III	1908	E
Varnum, Arthur C.	VII	1909	E
Vogt, Alfred H.	III	1902	E
Vogt, Alfred H.	IIb	1909	E
Vogt, Harry A.	Vb	1906	E
Walker, Anna G. (See Pradel)			
Walker, David	III	1902	E
Walker, David	P. G. III	1903	E
Walker, William, Jr.	VII	1906	E
Walsh, Michael L.	I	1909	E
Ward, James J.	VII	1906	E
Wardrobe, William L.	I	1900	E
Ware, Edward W.	III	1909	E
Warren, Philip H.	II	1905	D
Waterhouse, Joseph	IV	1900	E
Waterworth, Frank W.	Vb	1907	E

Name	Course	Class	Day or Evening
Watson, Luther F.	IIb	1909	E
Webb, Francis H.	V	1904	E
Webb, Francis H.	III	1907	E
Webb, Frank H.	IV	1904	D
Webber, Arthur H.	IV	1901	D
Webber, John F.	III	1907	E
Webber, John F.	P. G. III	1908	E
Weigel, Frederick A.	VIb	1909	E
Weinz, W. Elliott	IV	1908	D
Welch, Benjamin L.	VIb	1910	E
Wesson, Paul B.	I	1901	E
Wahlberg, Einar S.	I	1907	E
Wheelock, Stanley H.	II	1905	D
*Whitcomb, Harry E.	I	1906	E
Whitcomb, Roscoe M.	IV	1910	D
White, Royal P.	II	1904	D
Whitehead, Bennett	IIb	1901	E
Whitman, William P.	IVa	1910	E
Whitney, Frederick A.	IV	1910	E
Whittaker, Thomas	IIb	1907	E
Whittaker, Thomas	IIb	1908	E
Wiggin, Leon M.	III	1907	E
Wiggin, Leon M.	P. G. III	1908	E
Wightman, William H.	IV	1906	D
Wilde, Thomas E.	IIa	1905	E
Willey, Frank S.	I	1901	E
Willgeroth, Henry J.	III	1908	E
Williams, Allen R.	I	1910	E
Williamson, Isaac F.	IV	1901	E
Wilmot, Joseph	III	1908	E
Wilmot, William	III	1899	E
Wilson, Calvin E.	IIb	1902	E
Wilson, George H.	IIb	1902	E
Wilson, John S.	II	1903	D
Wilson, Walter E. H.	I	1904	D
Wilton, George H.	III	1899	E
Wing, Charles T.	III	1900	E
Wing, Charles T.	III	1902	D
Wingate, William H.	IV	1908	D
Wise, Paul T.	II	1901	D
Wiswall, Frank T.	V	1905	E
Wolf, William C.	Va	1907	E
Wolf, William C.	Vb	1908	E
Wolger, John J.	III	1907	E
Wood, Herbert C.	I	1906	D
Wood, J. Carleton	IV	1909	D
Wood, Jonathan	I	1902	E
Wood, Jonathan	Va	1908	E
Woodbury, W. Sanford	I	1900	E
Woodcock, Eugene C.	II	1907	D
Woodies, Ida A.	IIIb	1900	D
Woodies, Ida A.	P. G. IIIb	1901	D
Woodman, Harry L.	I-III-V	1902	D
Woodruff, Charles B.	V	1906	D
Worthington, John A.	I	1910	E
Wright, Edward, Jr.	II	1905	D
Yare, John F.	Vb	1907	E
Young, Richard, Jr.	Va	1908	E
Young, Richard, Jr.	Vc	1909	E

*Deceased

REGISTER OF GRADUATES

(P. G.) Indicates Post Graduate Course

(x) Indicates Last Known Address

(*) Deceased

Day Course, 1899

Diploma Graduates		
Name	Course	Occupation
Bailey, Joseph W.	I	Superintendent, Samoset Mills, Valley Falls, R. I.
xCuttle, James H.	II	Designer, William Whitman and Co., New York City.
xFels, August B.	II	Yarn Salesman, New England Cotton Yarn Co., New York City.
Harmon, Charles F.	I	In business, Lowell, Mass.
*Smith, Albert A.	I	
xTilton, Elliott T.	II	Electrician, General Electric Co., Boston, Mass.

Certificate Holders

Burrage, Katherine C.	IIIb	Teacher, Evening Drawing School, Lowell, Mass.
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Evening Course, 1899

Certificate Holders		
*Berry, Frank M.	III	
Binns, Heaton	II-V	Foreman, Worsted Department, Shuttleworth Bros. Co., Amsterdam, N. Y.
xBroadbent, James T.	I	In Converting House, New York City.
xCollier, John	III	Superintendent, American Woolen Company, No. Vassalboro, Me.
Crompton, Henry H.	II	Overseer, Worsted Spinning, Lower Pacific Mills, Lawrence, Mass.
Gaunt, Alfred C.	III	Treasurer and Manager, Tremont Worsted Co., Methuen, Mass.
Kellett, Irvine	II	Second Hand Worsted Spinning, Lower Pacific Mills, Lawrence, Mass.
Marjerison, Isaiah D.	II	Overseer Worsted Combing, Lower Pacific Mills, Lawrence, Mass.
*McAlister, John W.	V	
Moir, Alexander L.	III	Letter Carrier, Lowell, Mass.
xNoble, John T.	V	With Amoskeag Mfg. Co., Manchester, N. H.
xNugent, Thomas A.	II-V	Amsterdam, N. Y.
xSpedding, Ephraim H.	III	Second Hand, Weaving, Tremont and Suffolk Mills, Lowell, Mass.
xStevenson, William	II	Supt. Franklin Woolen Mills, Franklin, Ky.
Stopherd, William H.	II-V	Overseer, Worsted Spinning, Bigelow Carpet Co., Lowell, Mass.

Name	Course	Occupation
Swift, Edward S.	V	Novice of the Society of Jesus, St. Andrew-on-Hudson, Poughkeepsie, N. Y.
Wilmot, William	III	Designer, Hamilton Webb Co., Hamilton, R. I.
xWilton, George H.	III	Overseer, M. T. Stevens and Sons Company, No. Andover, Mass.

Day Course, 1900

Diploma Graduates

Baldwin, Arthur L.	IV	Clerk, Boston & Maine Freight, Lowell, Mass.
Barr, I. Walwin	I	Styler, F. U. Stearns & Co., New York City.
Bodwell, Henry A.	II	Supt., Smith and Dove Mfg. Co., Andover, Mass.
Brickett, Chauncey J.	II	Principal, School of Textiles, International Correspondence Schools, Scranton, Pa.
Lamson, George F.	I	Draftsman, Chas. T. Main, Boston, Mass.
Perkins, John E.	III	Asst. Supt., S. N. and C. Russell Mfg. Co., Pittsfield, Mass.
Pradel, Alois J.	III	Designer and Asst. Supt., Montrose Mills, Woonsocket, R. I.
Sleeper, Robert R.	IV	Instructor in Dyeing, Lowell Textile School, Lowell, Mass.
Smith, Stephen E.	I	Head instructor, Cotton Department, Lowell Textile School, Lowell, Mass.
Stewart, Arthur A.	II	Head instructor, Finishing, Lowell Textile School, Lowell, Mass.
Syme, James F.	II	Agent, Saxonville Mills, Saxonville, Mass.
Thompson, Henry J.	IV	Dyer, Boston Rubber Shoe Co., Malden, Mass.

Certificate Holders

Burrage, Katherine C.	P. G. IIIb	See Day Course, 1899.
Campbell, Laura E.	IIIb	Designer, Lowell, Mass.
xHarrison, Mrs. Amy H. (Goodhue)	IIIb	Dracut, Mass.
Lakeman, Fannie S.	IIIb	Designer, Salem, Mass.
xLeach, John P.	I-V	Foreman, Harriet Cotton Mills, Henderson, N. C.
Merchant, Edith C.	IIIb	Designer, Lowell, Mass.
Parker, Harry C.	V	With George Lincoln Parker, Boston, Mass.
Woodies, Ida A.	IIIb	Designer, Boston, Mass.

Evening Course, 1900

Certificate Holders

Campbell, Albert D.	IIb	Drawing Section Hand, Arlington Mills, Lawrence, Mass.
Cawthra, Albert B.	IIb	Overseer, Silesia Worsted Mills, North Chelmsford, Mass.

Name	Course	Occupation
Colby, Arthur D.	I	Draftsman, Lowell Machine Shop, Lowell, Mass.
Donnelly, James	I	Overseer, Mule Spinning, Stark Mills, Manchester, N. H.
xElston, Fred R.	III	Asst. Supt. and Designer, Shackamaxon Worsted Co., Philadelphia, Pa.
Howard, John	V	Overseer, Weaving, Masconia Mill, Lebanon, N. H.
Hutton, Clarence	V	Circulation Manager, Lord and Nagle Co., Boston, Mass.
Jones, William J.	IIb	Overseer, Worsted Spinning, U. S. Bunting Co., Lowell, Mass.
xMaden, Harry	IIb	North Adams, Mass.
Nelson, Ernest H.	IIb	Designer, Merrimack Mfg. Co., Lowell, Mass.
Ogley, Samuel A.	IIb	Overseer, Worsted Spinning, Brookside Worsted Mills, North Chelmsford, Mass.
xOsgood, Charles F.	I	Draftsman, General Electric Company, Lynn, Mass.
*Rowell, Herman C.	I-IIb	
Silcox, Arthur E.	I	Draftsman, Lowell Machine Shop, Lowell, Mass.
Snow, Fred L.	IV	Granite Contractor, Snow & Horsfall, Lowell, Mass.
xWardrobe, Wm. L.	I	Ware, Mass.
xWaterhouse, Joseph	IV	Section Hand, Merrimack Mfg. Company, Lowell, Mass.
Wing, Charles T.	III	Designer, Middlesex Mfg. Company, Lowell, Mass.
Woodbury, W. Sanford	I	Overseer, Carding, Orswell Mills, Fitchburg, Mass.

Day Course, 1901

Diploma Graduates

Buchan, Donald C.	II	Assistant Superintendent, Stevens Mills, North Andover, Mass.
Currier, John A.	II	Superintendent, Pentucket Mills, M. T. Stevens and Sons Co., Haverhill, Mass.
xEwer, Nathaniel T.	IV	Chemist, American Dyewood Co., Chester, Pa.
Foster, Clifford E.	II	Superintendent, Champlain Silk Mills, Whitehall, N. Y.
Kingsbury, Percy F.	IV	Overseer, Color Dept., Merrimack Mfg. Co., Lowell, Mass.
Marinel, Walter N.	I	North Chelmsford, Mass.
Moorhouse, William R.	IV	Chemist, Cassella Color Co., Boston, Mass.
Parker, B. Moore	I	Instructor, Carding and Spinning, A. and M. College, West Raleigh, N. C.
Webber, Arthur H.	IV	Beverly, Mass.
Wise, Paul T.	II	Agent, Bigelow Carpet Co., Clinton, Mass.

Certificate Holders

Name	Course	Occupation
Bradley, Richard H.	V	Loomfixer, Barnaby Mfg. Co., Fall River, Mass.
xHarrison, Mrs. Amy H. (Goodhue)	P. G. IIIb	See Day, 1900.
Minge, Jackson C.	IV	Treasurer, Minge Mfg. Co., Demopolis, Ala.
Woodies, Ida A.	P. G. IIIb	See Day, 1900.

Evening Course, 1901

Certificate Holders

xAspinwall, William	IIb	Philadelphia, Pa.
*Berry, Frank M.	V	
xBrooks, Noah	III-V	Lowell, Mass.
xBurghardt, Paul C.	IIa	Second Hand, Card Room, Merrimack Woolen Co., Lowell, Mass.
Buzzell, William O.	III	Overseer, Weaving, Bristol Mfg. Co., New Bedford, Mass.
Cheetham, John James	III	Brunswick, Me.
Chippindale, Ernest W.	IIb	Section Hand, Silesia Worsted Mills, No. Chelmsford, Mass.
Cowdell, Herbert	V	Loomfixer, Hamilton Mfg. Co., Lowell, Mass.
xDavis, Henry	IIb	Overseer, Carding, Silesia Worsted Mills, No. Chelmsford, Mass.
xDonovan, Daniel F.	IIa	Second Hand, Woolen Carding, Yonkers, N. Y.
xEvison, William A.	V	Loomfixer, Mass. Cotton Mills, Lowell, Mass.
Farrell, Thomas	IIa	Woolen Spinner, Stirling Mills, Lowell, Mass.
Frame, William C.	V	Overseer, Johnson & Johnson, New Brunswick, N. J.
Gagan, John H.	V	Overseer, Stirling Mills, Lowell, Mass.
Grant, Archibald	IIb	Section Hand, Spinning, Bigelow Carpet Co., Lowell, Mass.
Gourke, Michael	IIb	Overseer, Drawing, Bigelow Carpet Company, Lowell, Mass.
Hill, Daniel	IIb	Overseer, Maine Alpaca Co., Springvale, Me.
Hitchcock, Thomas B.	I-IIa-III	With Consolidated Cotton Duck Company, New York City.
xHolgate, Charles H.	IIa	Manager, Selmar Hess, New York City.
xHunter, Ralph	III	Salesman, Hall, Hartwell and Company, Troy, N. Y.
Jones, William J.	IIa	See Evening, 1900.
Killerby, Walter	IIb	Overseer, Park Worsted Mill, Lowell, Mass.
Law, Alfred	IIb	Overseer, Arlington Mills, Lawrence, Mass.
Lord, Wilfred	III	Assistant Superintendent, Lower Pacific Mills, Lawrence, Mass.
McQuade, Hugh B.	V	Loomfixer, Bigelow Carpet Company, Lowell, Mass.

Name	Course	Occupation
Minge, Jackson C.	III	See Day, 1901.
Morris, Frank A.	V	Loomfixer, Lowell, Mass.
Nelson, Ernest H.	IIa	See Evening, 1900.
Noble, John T.	III	See Evening, 1899.
Peel, Hudson	IIb	Section Hand, Arlington Mills, Lawrence, Mass.
Reynolds, Hiram L.	III	Agent, Saunders Cotton Mills, Saundersville, Mass.
xSaunders, Edward B.	III	In business, Fall River, Mass.
Scanlon, Edward J.	IIb	Methuen Hat Works, Methuen, Mass.
xShannon, Philip J.	V	Loomfixer, American Woolen Co., Lebanon, N. H.
xSmith, Fred	IIb	Supt., Yarn Dept., Wood Worsted Mills, Lawrence, Mass.
Swift, Edward S.	I	See Evening, 1899.
Wesson, Paul B.	I	Foreman Machinist, Lowell Machine Shop, Lowell, Mass.
xWhitehead, Bennett	IIb	Overseer, Wood Worsted Mills, Lawrence, Mass.
xWiley, Frank S.	I	Second Hand, Picking and Carding, Pacific Mills, Lawrence, Mass.
Williamson, Isaac F.	IV	Overseer, Dyeing Dept., Hamilton Mfg. Co., Lowell, Mass.

Day Course, 1902

Diploma Graduates

xBurnham, Frank E.	IV	Chemist, Avery Chemical Co., Boston, Mass.
Carter, Robert A.	IV	Chemist and Salesman, Roessler & Hasslacher Chemical Company, New York City.
xCraig, Clarence E.	III	With Kansas City Cotton Mills Co., Kansas City, Kans.
xHaskell, Walter F.	IV	Overseer of Dyeing, Dana Warp Mills, Westbrook, Me.
Ramsdell, Theodore E.	I	Agent, Monument Mills, Housatonic, Mass.
Swift, Edward S.	I	See Evening, 1899.
Wing, Charles T.	III	See Evening, 1900.

Certificate Holders

Curran, Charles E.	II-III-V	Head Designer, Wood Worsted Mills, Lawrence, Mass.
Ferguson, Arthur F.	I	Instructor, Design Dept., Lowell Textile School, Lowell, Mass.
Harris, George S.	I	Agent, Lanett Cotton Mills, West Point, Ga.
Holgate, Benjamin,	III	Cost Accountant, Boott Mills, Lowell, Mass.
Woodman, Harry L.	I-III-V	Installer, Barber, Coleman Co., Boston, Mass.

Evening Course, 1902

Certificate Holders		
Name	Course	Occupation
xAdams, Wm. R.	IIa	Pressman, Stevens Mills, No. Andover, Mass.
xBarlow, Robert	V	Clerk, Lowell, Mass.
Binns, Heaton	VI	See Evening, 1899.
Bowring, George P. B.	VI	Machinist, Lowell Machine Shop, Lowell, Mass.
xBrainerd, Irving L.	I	Overseer, Carding, W. L. Barrell and Co., Lawrence, Mass.
xBurghardt, Edward S.	IIa	Lawrence, Mass.
Buzzell, Wm. O.	P. G. III	See Evening, 1901.
Cheetham, John James	P. G. III	See Evening, 1901.
Collier, John	P. G. III	See Evening, 1899.
xCowdrey, Charles E.	V	Overseer, Talbot Mills, North Billerica, Mass.
xCremin, Daniel J.	I	Second Hand, Boott Mills, Lowell, Mass.
xDonnellan, Frank T.	IIa	Lowell, Mass.
xDudley, George E.	I	Third Hand, Carding, Mass. Mills, Lowell, Mass.
Ferguson, Thomas	V	Overseer, Boott Mills, Lowell, Mass.
xField, Charles W.	VI	Draftsman, C. F. Morrill, Somerville, Mass.
xForrest, Fred G.	IIa	Finishing Room, Middlesex Co., Lowell, Mass.
xFortune, David A.	IIb	Section Hand, Worsted Spinning, Lower Pacific Mills, Lawrence, Mass.
Gaunt, Alfred C.	P. G. III	See Evening, 1899.
xGood, Henry	I	Providence, R. I.
xHaigh, Walter	III	U. S. Bunting Co., Lowell, Mass.
xHaworth, Joseph	VI	Travelling Machinist, C. G. Sargent's Sons Corp., Graniteville, Mass.
Hogan, James A.	V	Hogan Bros., Lowell, Mass.
Hoyle, Edward	IIb	Treasurer, Allerton Worsted Mills, Lowell, Mass.
xJohnson, Ernest A.	IIa-b	Asst. Supt., Washington Mills, Lawrence, Mass.
Kelley, Michael H.	I	Overseer, Appleton Co., Lowell, Mass.
Kent, Ernest J.	IIb	Section Hand, English Drawing, Lower Pacific Mills, Lawrence, Mass.
Lamont, Walter M.	IIb	Agent, Wood Worsted Mill, Lawrence, Mass.
xLawliss, Augustine J.	V	Overseer, Weaving, Belvidere Woolen Co., Lowell, Mass.
Lee, Charles	I	Machinist, Lowell Machine Shop, Lowell, Mass.
Leith, Edwin E.	III	Asst. Supt., Thos. Kent Mfg. Co., Clifton Heights, Pa.
Libby, C. Robert	VI	Draftsman, Locks & Canals, Lowell, Mass.
Molloy, Andrew	V	Overseer, Tremont and Suffolk Mills, Lowell, Mass.
Nugent, Thomas A.	VI	See Evening, 1899.
Osgood, Charles F.	VI	See Evening, 1900.
Potter, Richard W.	V	Second Hand, Weaving, Mass. Cotton Mills, Lowell, Mass.

Name	Course	Occupation
xRockwell, Samuel F.	IIa	Superintendent, Mule Dept., Davis and Furber Machine Co., No. Andover, Mass.
Schermerhorn, George E.	I	Overseer, Boott Mills, Lowell, Mass.
Smith, Wm. H.	IIb	Stamp Clerk, Postoffice, Lawrence, Mass.
Stevenson, William	III	See Evening, 1899.
Stopherd, Wm. H.	VI	See Evening, 1899.
Umpleby, Thomas B.	V	Superintendent, J. A. Humphrey and Son, Ltd., Moncton, N. B.
Varney, Manley H.	III	Superintendent, Finishing Dept., Amoskeag Mfg. Co., Manchester, N. H.
xVogt, Alfred H.	III	Designing Room, George E. Kunhardt, Lawrence, Mass.
Walker, David	III	Overseer, Burlington Mills, Winooski, Vt.
xWilson, Calvin E.	IIb	Overseer, Twisting, Cranston Worsted Mills, Bristol, R. I.
Wilson, George H.	IIb	Section Hand, Lower Pacific Mills, Lawrence, Mass.
Wood, Jonathan	I	Overseer, Boott Mills, Lowell, Mass.

Day Course, 1903

Diploma Graduates

xBloom, Wilfred N.	IV	Asst. Mgr., Read, Holliday and Sons, Ltd., New York City.
Campbell, Orison S.	II	Asst. Supt., American Felt Co., Dolgeville, N. Y.
Chamberlin, Frederick E.	I	With Monument Mills, Housatonic, Mass.
Emerson, Frank W.	II	Supt. Moosup Mills, Moosup, Conn.
Evans, Alfred W.	III	Arlington Mills, Lawrence, Mass.
xEvans, William R.	III	Bradford, Mass.
Ferguson, Arthur F.	I	See Day, 1902.
xFuller, George	I	Designer, Arnold Print Works, No. Adams, Mass.
Gerrish, Walter	III	With Allen Lane Co., Boston, Mass.
Morrison, Fred C.	I	Clerk, Levi W. Phelps, Ayer, Mass.
Najarian, Garabed	IV	Overseer of Dyeing, Monument Mills, Housatonic, Mass.
*Rasche, Wm. A.	III	
xSnelling, Fred N.	II	With American Express Co., Haverhill, Mass.
xStewart, Walter L.	III	Designer, Clarence Whitman and Company, New York City.
xWilson, John S.	II	With H. Banendahl & Co., New York City.

Certificate Holders

Bennett, Edward H.	V	Business Mgr., F. P. Bennett and Co., New York City.
Campbell, Louise P.	IIIb	Designer, Lowell, Mass.
Holgate, Benjamin	V	See Day, 1902.
Hutton, Clarence	III	See Evening, 1900.
Petty, George E.	I-V	In business, Greensboro, N. C.
Pradel, Mrs. A. J. (Walker)	IIIb	Woonsocket, R. I.

Name	Course	Occupation
xReynolds, Isabel H.	III-V	Clerk, Arlington Mills, Lawrence, Mass.
xRobinson, William C.	III-V	With Russell Mfg. Co., Middletown, Conn.
xSpiegel, Edward	V	In business, New York City.
xStevenson, Murray R.	III-V	Draftsman, City Hall, Pasadena, Cal.

Evening Course, 1903

Certificate Holders

Adams, Henry S.	IIa	Secretary and Treasurer, The Springstein Mills, Chester, S. C.
Balmforth, James H.	IIa	Stamp Clerk, P. O., Bloomfield, N. J.
Barry, Edward J.	III	Overseer, Jackson Mfg. Company, Nashua, N. H.
Bastow, Henry	III	Warp Dresser, Mass. Mohair Plush Co., Lowell, Mass.
xBaxter, Alvah J.	IIa	Bookkeeper, Assabet Mills, Maynard, Mass.
Byam, Walter S.	VI	Timekeeper, Lowell Machine Shop, Lowell, Mass.
xCady, Dennis J.	V	Section Hand, Washington Mills, Lawrence, Mass.
Donnellan, Frank T.	V	See Evening, 1902.
Flynn, John J.	VI	Bookkeeper, Coffey Bros., Lowell, Mass.
French, Mrs. Martha B. (Balmforth)	III	Tewksbury, Mass.
Garner, William	III	Foreman of Refinery, Warren Bros. Co., Washington, D. C.
Gaunt, Alfred C.	IIa	See Evening, 1899.
Goodchild, George	I	Draftsman, Lowell Machine Shop, Lowell, Mass.
Gray, Finley M.	VI	Clerk, Merrimack Mfg. Co., Lowell, Mass.
xHiggins, James A.	IIa	Spinner, Talbot Mills, No. Billerica, Mass.
Howard, John	III	See Evening, 1900.
Hunter, Ralph	V	See Evening, 1901.
Jennings, James J.	III	Designer, Lyman Mills Co., Holyoke, Mass.
Johnson, Samuel L.	V	Second Hand, Weaving, Arlington Mills, Lawrence, Mass.
xKeleher, John J.	IIb	Overseer, Drawing Dept., Prospect Mill, Lawrence, Mass.
Knowles, Frank E.	I	Inspector, Factory Mutual Insurance Co., Boston, Mass.
xLawrence, Charles	I	Overseer, Mule Spinning, Dartmouth Corp., New Bedford, Mass.
Leach, Joseph W.	V	Designer, Pacific Mills, Lawrence, Mass.
Lincourt, Hector L.	VI	Tool Draftsman, United Shoe Machinery Co., Beverly, Mass.
Lord, Wilfred	IIb	See Evening, 1901.
xMason, Frederick A.	I	Mule Spinner, Saxony Worsted Mills, Newton, Mass.
Moir, Alexander L.	P. G. III	See Evening, 1899.
Mortenson, Carl W.	III	Paymaster, Talbot Mills, No. Billerica, Mass.
*Mozley, Arthur	VI	
Myers, James W.	III-IV	Clerk, U. S. Bunting Co., Lowell, Mass.

Name	Course	Occupation
xNicholson, Richard	I Ib	Section Hand, Washington Mills, Lawrence, Mass.
xNoonan, Denis T.	III	Asst. Supt., Knoxville Woolen Mills, Knoxville, Tenn.
Palmer, G. Buel	III	Melrose, Mass.
xRockwell, Henry D.	I Ia	Clerk, Davis and Furber Machine Co., No. Andover, Mass.
xSchofield, John S.	III	Asst. Supt. and Designer, Lawrence Keegan Mill, Wilsonville, Conn.
Schoon, Fenton	I Ib	Section Hand, Worsted Drawing, Pacific Mills, Lawrence, Mass.
Stokham, Burton I.	IV	Chemist, Bigelow Carpet Company, Lowell, Mass.
xTonge, Matthew	III	Weaver, Dartmouth Mfg. Co., New Bedford, Mass.
xUpton, Frank A.	I	Overseer, Carding, I. E. Palmer Co., Middletown, Conn.
Varney, Manley H.	I	See Evening, 1902.
Walker, David	P. G. III	See Evening, 1902.

Day Course, 1904

Diploma Graduates

Abbott, Edward M.	II	Asst. Agent, Abbott Worsted Co., Graniteville, Mass.
xBaldwin, Frederick A.	II	With Walter Blue and Company, Ltd., Sherbrooke, P. Q., Canada.
Clapp, F. Austin	II	Salesman, Arthur G. Meyer, New York City.
Clogston, Raymond B.	IV	Fancy Dyer, Arnold Print Works, No. Adams, Mass.
Culver, Ralph F.	IV	Supt. Holliston Mills, Norwood, Mass.
xCutler, Benj. W., Jr.	III	With W. H. Hinchman and Co., New York City.
Dewey, James F.	II	Supt., Dewey's Mills, Quechee, Vt.
Donald, Albert E.	II	Assistant Superintendent, Uxbridge Worsted Co., Uxbridge, Mass.
Jury, Alfred E.	IV	Chemist, Wells and Richardson Company, Burlington, Vt.
Lucey, Edmund A.	II	Sayles Bleachery, Saylesville, R. I.
MacPherson, Wallace A.	III	First Assistant Designer, National & Providence Worsted Mills, Providence, R. I.
Meadows, William R.	I	Treasurer, Valley Creek Cotton Mills, Selma, Ala.
Stevens, Dexter	I	Supt. of Yarn Dept., Lancaster Mills, Clinton, Mass.
Webb, Frank H.	IV	Chemist, Washington Mills, Lawrence, Mass.
White, Royal P.	II	Supt., Stirling Mills, Lowell, Mass.

Certificate Holders

xHalsell, Elam R.	I	Overseer, Hamilton Co., Lowell, Mass.
Horsfall, George G.	II-III-V	Asst. Designer, Martinsburg Worsted and Cassimere Co., Martinsburg, W. Va.

Name	Course	Occupation
xJones, Everett A.	II	Supt., Nye and Wait Carpet Co., Auburn, N. Y.
xO'Donnell, John D.	I	Clerk, Travers Bros. Co., New York City.
xO'Hara, Wm. F.	IV	Chemist, Arthur Merritt, Boston, Mass.
Parker, Everett N.	I	With Parker Spool and Bobbin Company, Lewiston, Me.
xSmith, Ralston F.	I	Secretary and Treasurer, Davies Printing Co., Cleveland, Ohio.
xToovey, Sidney E.	V	Pattern Dresser and Weaver, Talbot Mills, No. Billerica, Mass.
Wilson, Walter E. H.	I	Machinist, D. H. Wilson and Co., Lowell, Mass.

Evening Course, 1904

Certificate Holders

Adams, Michael E.	VI	Bookkeeper, Lowell Storage Warehouse Co., Lowell, Mass.
Balmforth, James H.	IIa-b	See Evening, 1903.
xBalmforth, Wm. F.	VI	No. Billerica, Mass.
xBarker, John P.	V	Peacedale, R. I.
Barrington, John A.	IV	Manager, Colonial Woolen Mills, Methuen, Mass.
xBoucher, John L.	VI	Lowell, Mass.
xButler, Benj. O.	VI	Lowell, Mass.
xCallahan, Patrick A.	VI	With Lower Pacific Mills, Lawrence, Mass.
Cheetham, John Joseph	I	Carder, Lowell, Mass.
xConley, Frederick A.	VI	Machinist, Kitson Machine Co., Lowell, Mass.
Connors, Edward F.	VI	Draftsman, Locks and Canals, Lowell, Mass.
Davis, Prentice T.	I	Overseer, Bigelow Carpet Co., Lowell, Mass.
Delmage, Edward R.	III	Overseer Weaving, Thos. Kent Mfg. Co., Clifton Heights, Pa.
xDempsey, John W.	IIa	Spinner, Bigelow Carpet Co., Lowell, Mass.
xDonahue, Michael F.	VI	Boston, Mass.
Doole, George L.	VI	Weaver, U. S. Bunting Co., Lowell, Mass.
Dooley, Edward W.	VI	With Spencer and Co., Lowell, Mass.
Duggan, Francis P.	VI	Second Hand, U. S. Cartridge Co., Lowell, Mass.
Frank, Emil M.	III	Asst. Designer, Arlington Mills, Lawrence, Mass.
Gaunt, Alfred C.	IIb	See Evening, 1899.
Hempel, Frank	V	Signal Dept., Boston & Maine Railroad, Lawrence, Mass.
Higgins, James A.	IIa-b	See Evenings, 1903.
xHoyle, Joseph	IIb	Overseer, Drawing, Silesia Worsted Mills, No. Chelmsford, Mass.
Jeannotte, Arthur	VI	With Heinze Electric Co., Lowell, Mass.
xKershaw, Wm. E.	V	Weaver, Talbot Mills, No. Billerica, Mass.
Langevin, Felix D.	VI	Asst. Supt., Kitson Machine Shop, Lowell, Mass.

Name	Course	Occupation
xLord, Harry D.	III	Lowell, Mass.
Lord, Wilfred	IIa	See Evening, 1901.
xMcBride, Robert G.	IIa	Mule fixer, Merrimack Woolen Mills, Lowell, Mass.
Merrill, Edwin C.	VI	Draftsman, Eng. Dept., City Hall, Lawrence, Mass.
Miller, Emil H.	V	Charge of Supply Dept., Lowell Pacific Mills, Lawrence, Mass.
Moorehouse, Thomas	VI	Electrician, Everett Mills Power Station, Lawrence, Mass.
Murphy, John H.	VI	Secretary, Board of Trade, Lowell, Mass.
Notman, Frederick W.	I	Clerk, Mass. Cotton Mills, Boston, Mass.
xPatrick, Alexander	III	Omaha, Neb.
Redman, Henry S.	III	Asst. Supt., Appleton Co., Lowell, Mass.
xReed, Foster C. K.	VI	Steam Engineer, Farwell Bleachery, Lawrence, Mass.
Rhodes, Joseph E.	V	Wire Sharpener, Mass. Mohair Plush Co., Lowell, Mass.
Rooney, George W.	I	Overseer, N. H. Spinning Mills Co., Penacook, N. H.
Shaw, James	V	Loomfixer, Lowell, Mass.
Smith, Edward	I	Overseer, Carding, Boott Mills, Lowell, Mass.
xSmith, John W.	IIb	Section Hand, Arlington Mills, Lawrence, Mass.
xSterling, Walter	III	New Bedford, Mass.
Stokham, Burton I.	P. G. IV	See Evening, 1903.
xTarpey, John F.	IIa	With Merrimack Mfg. Co., Lowell, Mass.
Thompson, Charles B.	VI	Clerk, B. and M. Railroad, Lowell, Mass.
Webb, Francis H.	V	With Frank E. Bassett, Lowell, Mass.

Day Course, 1905

Diploma Graduates

Adams, Henry S.	I	See Evening, 1903.
Boyd, George A.	I	Treasurer's Office, Harmony Mills, Boston, Mass.
Carr, George E.	I	Foreman, Wyoming Valley Lace Mills, Wilkesbarre, Pa.
Cole, James T.	II	Manager, Industrial Dept., Mass. Commission for Adult Blind, Cambridge, Mass.
xDillon, James H.	III	With Walworth Bros., Boston, Mass.
Harris, Charles E.	I	Proprietor, Harris Garage and Machine Co., Easthampton, Mass.
Hollings, James L.	I	Supt., A. Zeigler and Sons, Boston, Mass.
Hook, Russell W.	IV	Chemist, Arthur D. Little, Inc., Boston, Mass.
Jones, Everett A.	III	See Day, 1904.
Lewis, Walter S.	IV	Asst. Physicist, Bureau of Standards, Washington, D. C.
xMcKenna, Hugh F.	IV	Chemist, United Indigo and Chemical Co., Ltd., Chelsea, Mass.

Name	Course	Occupation
Midwood, Arnold J.	IV	Chemist, Levinstein and Company, Boston, Mass.
Moore, Everett B.	I	With Chadbourne and Moore, Chelsea, Mass.
Parker, Everett N.	I	See Day, 1904.
Thompson, Everett L.	I	With Brown, Durrell and Company, Boston, Mass.
Warren, Philip H.	II	Superintendent, Hopeville Mfg. Co., Worcester, Mass.
Wheelock, Stanley H.	II	Superintendent, Stanley Woolen Company, Uxbridge, Mass.

Certificate Holders

Arundale, Henry B.	II-III-V	Instructor, Lawrence Industrial School, Lawrence, Mass.
Conklin, Jennie G.	IIIb	Commercial Designer, Boston, Mass.
xCurtis, William L.	II	Of Jackson and Co., Boston, Mass.
Hunt, Chester, L.	III	With United Shoe Machinery Co., Beverly, Mass.
Lee, William H.	V	Overseer, Farr Alpaca Co., Holyoke, Mass.
Roberson, Pat H.	I	With James R. Roberson and Son, Cropwell, Ala.
Roberts, Carrie I.	IIIb	Designer, Lowell, Mass.
xThomas, Roland V.	I	Lowell, Mass.
Wright, Edward, Jr.	II	Assistant Engineer's Dept., Mass. State Board of Health, Boston, Mass.

Evening Course, 1905

Certificate Holders

Bake, Herbert	III	Designer, Walworth Brothers, Lawrence, Mass.
Bastow, Henry	V	See Evening, 1903.
xBell, Frederick W.	IIa	With Mass. Mills, Lowell, Mass.
Bowie, Samuel A.	VI	Lawrence, Mass.
xBrown, James P.	III	Section Hand, Silesia Worsted Mills, No. Chelmsford, Mass.
xBryant, Ernest L.	VI	Clerk, D. B. Wilson Company, Waterbury, Conn.
xBurke, Thomas F.	I	Lowell, Mass.
Burns, Edward J.	IV	Tester, U. S. Cartridge Company, Lowell, Mass.
Burns, James E.	IV	Chemist, U. S. Cartridge Co., Lowell, Mass.
Caron, Cleophas	I	Overseer, Spinning Dept., Queen City Cotton Co., Burlington, Vt.
Collins, John A.	IIa-b	Secretary, Mutual Boiler Ins. Company, Boston, Mass.
xCook, Cheney E.	III	Buyer, Winslow Bros. and Smith Company, Norwood, Mass.
xCuster, James E.	V	Lowell, Mass.
Dana, Clarence A.	VI	Draftsman, Lowell Machine Shop, Lowell, Mass.

Name	Course	Occupation
Dick, Hugo P.	III	Designer, Tilton Mills, Valley Falls, R. I.
xDimlick, Benj. C.	III	Signal Dept., B. & M. Railroad, South Lawrence, Mass.
xErbe, Gustave	VI	Foreman, J. L. Thomason, Mfg. Company, Waltham, Mass.
xFoster, Sherwood L.	I	With Lowell Brass Foundry, Lowell, Mass.
xFrench, Ernest J.	I	Clerk, Upper Pacific Mills, Lawrence, Mass.
xGay, Earle B.	I	Second Hand Carding, Dana Warp Mills, Westbrook, Me.
Goodchild, George	VI	See Evening, 1903.
Harder, Elmer E.	VI	Janitor, Highland School, Lowell, Mass.
Haven, George W.	III	With Blake and Stearns, Boston, Mass.
Howard, Thomas	V	Overseer, T. Martin and Bro. Mfg. Co., Lowell Mass.
xHunt, Herbert R.	VI	Asst. Chief Draftsman, DeLamar's Copper Refining Co., Chrome, N. J.
Hunton, Lewis G.	IV	Shipping Clerk, C. I. Hood Co., Lowell, Mass.
Kenworthy, Joseph	I	Second Hand, Boott Mills, Lowell, Mass.
Kimball, Irving D.	VI	Patent Dept., Lowell Machine Shop, Lowell, Mass.
Lamson, George F.	VI	See Day, 1900.
Linkletter, Alfred C.	VI	Steamfitter, H. R. Barker Mfg. Co., Lowell, Mass.
xLovell, Charles E.	VI	Los Angles, Cal.
Maguire, James H.	VI	Overseer, Lowell Machine Shop, Lowell, Mass.
Martin, John C., Jr.	IIa-b	Tailor, J. C. Martin & Sons, Lowell, Mass.
xMcManus, Hugh	V	With Middlesex Co., Lowell, Mass.
Molloy, Andrew	III	See Evening, 1902.
O'Neill, Peter F.	IV	Warp Dyer, Arlington Mills, Methuen, Mass.
xOverend, John	V	Hand Dresser, Arlington Mills, Lawrence, Mass.
Redman, Henry S.	V	See Evening, 1904.
Silk, Frederick C. M.	IV	Carpet Inspector, Bigelow Carpet Co., Lowell, Mass.
Simola, Emil J.	IIa-b	Finland.
xSkinner, Clarence W.	III	With Brightwood Mfg. Co., No. Andover, Mass.
xSmith, Arthur	III	Designer, Pemberton Mills, Lawrence, Mass.
Smith, George A.	III	Superintendent and Designer, Tremont Worsted Co., Methuen, Mass.
Smith, Wm. E.	III	Cloth Inspector, Arlington Mills, Lawrence, Mass.
Stevens, Frank W.	VI	Assistant Engineer and Draftsman, Locks and Canals, Lowell, Mass.
Stopherd, Wm. H.	III	See Evening, 1899.
xTonge, John	IV	Asst. Dyer and Chemist, Dana Warp Mills, Westbrook, Me.
xWilde, Thomas E.	IIa	Stenographer, Jeremiah Clark Machine Co., Lowell, Mass.
Wiswall, Frank T.	V	Student, Lowell Textile School, Lowell, Mass.

Day Course, 1906

Diploma Graduates

Name	Course	Occupation
Avery, Charles H.	II	With Mauger & Avery, Boston, Mass.
Bradford, Roy H.	II	Asst. Supt., Smith and Dove Mfg. Com- pany, Andover, Mass.
Churchill, Charles W.	III	Treasurer, J. Harriman Narrow Fabric Co., Lowell, Mass.
Cole, Edward E.	IV	Salesman, Helburn Chemical Co., New York City.
Currier, Herbert A.	I	With James T. White, New York City.
Curtis, Frank M.	I	Salesman, H. M. Bickford Co., Boston, Mass.
xFleming, Frank E.	IV	Asst. Dyer and Finisher, Goodall Worsted Co., Sanford, Me.
Gahm, George L.	II	Superintendent, French System, Wood Worsted Mills, Lawrence, Mass.
Hennigan, Arthur J.	II	New England Representative, Talbot Mills, Boston, Mass.
Swan, Guy C.	II	Student, Stanford University, Palo Alto, Cal.
Varnum, Arthur C.	II	Assistant Designer, Talbot Mills, North Billerica, Mass.
Wightman, William H.	IV	Salesman, Farbenfabriken of Elberfeld Co., Boston, Mass.
Wood, Herbert C.	I	Instructor, Cotton Yarns, Lowell Textile School, Lowell Mass.

Certificate Holders

Church, Charles R.	II-V	Physical Director, Y. M. C. A., Methuen, Mass.
Gillon, Sara A.	IIIb	Designer, Lowell, Mass.
Hildreth, Harold W.	II-V	Section Hand, Arlington Mills, Lawrence, Mass.
Hintze, Thomas F.	I	New York City.
Kent, Clarence L.	III-V	With Metropolitan Life Insurance Com- pany of New York, Lawrence, Mass.
Lane, John W.	I	With Everett Mills, Lawrence, Mass.
McDonnell, William H.	I-V	South Boston, Mass.
Newcomb, Guy H.	IV	Mgr. Badische Co., San Francisco, Cal.
Reynolds, Isabel H.	P. G. III-V	See Day, 1903.
Stohn, Alexander C.	III-V	Textile Operator, C. Stohn, Jamaica Plain, Mass.
xWoodruff, Charles B.	V	With Goodall, Brown and Co., Birming- ham, Ala.

Evening Course, 1906

Certificate Holders

Abbott, Paul W.	I	Foreman, Cadillac Motor Car Co., Detroit, Mich.
xAmiot, Louis H.	Va	American Hide and Leather Co., Lowell, Mass.

Name	Course	Occupation
Armstrong, Elias B.	IIb	With Wellington, Sears & Co., Boston, Mass.
Bake, Herbert	P. G. III	See Evening, 1905.
xBrouder, John J.	III	Designer, Ayer Mills, Lawrence, Mass.
Brown, James P.	P. G. III	See Evening, 1905.
Brown, Wm. G.	IIb	President, Geo. C. Moore Wool Scouring Mills and Brookside Worsted Mills, No. Chelmsford, Mass.
Burgess, Joseph H.	Va	Pattern Weaver, Ayer Mills, Lawrence, Mass.
Burnham, Joseph W.	III	Designer, Lincoln Mills, Pascoag, R. I.
Burnham, Wilmont V.	Vb	Weaver, Wood Worsted Mills, Lawrence, Mass.
Dick, Hugo P.	P. G. III	See Evening, 1905.
xDickson, Andrew	IIa	Asst. Shipping Clerk, Coronet Worsted Co., Mapleville, R. I.
Dimlick, Benj. C.	P. G. III	See Evening, 1905.
Dodge, Frank	I	Overseer, Hamilton Co., Lowell, Mass.
Duce, Benjamin	III	Overseer, Weaving, Ayer Mills, Lawrence, Mass.
xEllis, George W.	VII	With A. D. Ellis & Sons, Monson, Mass.
Eyers, John T.	IV	Overseer, Finishing, James J. Regan Mfg. Co., Rockville, Conn.
Frank, Emil M.	P. G. III	See Evening, 1904.
xFulton, John M.	V	Lowell Bleachery, Lowell, Mass.
Gregson, Robert B.	Va	Second Hand, Combing Room, Grant Yarn Co., Fitchburg, Mass.
xHaigh, Wm.	Vb	Boott Mills, Mass.
xHartwell, Henry E.	VI	Engineer, Washington Mills, Lawrence, Mass.
Hoessler, Carl, Jr.	III	Overseer, Weaving, M. T. Stevens & Son, No. Andover, Mass.
Howard, John	IIa	See Evening, 1900.
xHutton, Harold	V	With N. E. Bunting Co., Lowell, Mass.
xHutton, John M.	Vb	With N. E. Bunting Co., Lowell, Mass.
xInberg, Magnus	I	Fitchburg, Mass.
Johnson, Ernest A.	V	See Evening, 1902.
xKidd, Thomas E.	IV	Boston, Mass.
xLaffert, August W.	III	Loomfixer, Wood Worsted Mills, Lawrence, Mass.
Maguire, James H.	I	See Evening, 1905.
xMcCarthy, Joseph F.	III	Cloth Examiner, Wood Worsted Mills, Lawrence, Mass.
McLaughlin, Peter J.	I	General Second Hand, Mass. Cotton Mills, Lowell, Mass.
xMcLay, John	Vb	Clerk, Washington Mills, Lawrence, Mass.
xMichelmores, Harry	III	Asst. Designer, Brightwood Mfg. Co., No. Andover, Mass.
Molloy, Andrew	P. G. III	See Evening, 1902.
Morton, Albert N.	IIb	At Lowell Machine Shop, Lowell, Mass.
xMurphy, Cornelius D.	IIa	Second Hand, N. E. Bunting Co., Lowell, Mass.
Nelson, Ernest H.	III	See Evening, 1900.
O'Brien, David A.	I	Manager, Hall & Lyon Co., Holyoke, Mass.
Pedler, Wm. A.	I	Clerk, Arlington Mills, Lawrence, Mass.

Name	Course	Occupation
Pihl, Christian E.	VI	Master Mechanic, Appleton Mills, Lowell, Mass.
xPittendreigh, John M.	I	Third Hand, Merrimack Mill, Lowell, Mass.
Reardon, Timothy H.	VI	Lowell, Mass.
Reynolds, Eugene A.	VI	With Lawrence Mfg. Co., Lowell, Mass.
xRichards, Francis G.	IIa	Wool Sorter, Arlington Mills, Lawrence, Mass.
Rushworth, Walter	VI	Electrician, Bryant & Co., Cambridge, Mass.
Schubert, George J.	V	Second Hand, Pemberton Co., Lawrence, Mass.
Senior, George	Va	Seattle, Wash.
Sharpe, John R.	VI	Overseer, Lowell Machine Shop, Lowell, Mass.
xSheppard, Byron H.	VI	Draftsman, C. R. Makepeace and Company, Providence, R. I.
xSilk, Patrick E.	VII	Second Hand, Finishing, Beaver Brook Mills, Collinsville, Mass.
Skinner, Clarence W.	P. G. III	See Evening, 1905.
Smith, Arthur	P. G. III Va	See Evening, 1905.
Smith, George A.	P. G. III	See Evening, 1905.
Smith, Wm. E.	P. G. III	See Evening, 1905.
Stopherd, Wm. H.	P. G. III	See Evening, 1899.
xVogt, Harry A.	Vb	Loomfixer, Geo. E. Kunhardt, Lawrence, Mass.
xWalker, Wm., Jr.	VII	Asst. to Supt., Ottaqueeche Woolen Co., No. Hartland, Vt.
xWard, James J.	VII	With U. S. Bunting Co., Lowell, Mass.
*Whitcomb, Harry E.	I	

Day Course, 1907

Diploma Graduates

Arundale, Henry B.	II	See Day, 1905.
Coman, James G.	I	Director, Mississippi Textile School, Agricultural College, Miss.
xCraig, Albert W.	IV	Color Chemist, Arthur Merritt, Boston, Mass.
Farmer, Chester J.	IV	Assistant, Department Biological Chemistry, Harvard Medical School, Boston, Mass.
xHaskell, Spencer H.	II	Worcester, Mass.
Hathorn, George W.	IV	Chemist, Lawrence Gas Co., Lawrence, Mass.
Hildreth, Harold W.	II	See Day, 1906.
Hoyt, Charles W. H.	IV	Second Hand, Dyeing, Merrimack Mfg. Co., Lowell, Mass.
Knowland, Daniel P.	IV	Chemist, Geigy-ter-Meer, New York City.
Mackay, Stewart	III	Instructor, Hand Loom Weaving, Lowell Textile School, Lowell, Mass.
xMerriman, Earl C.	II	With Jas. & E. H. Wilson, Pittsfield, Mass.

Name	Course	Occupation
xRaymond, Charles A.	IV	Chemist, N. E. Gas and Coke Company, Everett, Mass.
xStorer, Francis E.	II	Clerk, National Shawmut Bank, Boston, Mass.
Stursberg, Paul W.	II	Superintendent, Worsted Spinning Dept., Germania Mills, Holyoke, Mass.
Woodcock, Eugene C.	II	Instructor, Woolen Yarns, Lowell Textile School, Lowell, Mass.

Certificate Holders

xBrannen, Leon V.	III-V	Philadelphia, Pa.
Ehrenfried, Jacob B.	II-V	Buyer, George Ehrenfried Co., Lewiston, Me.
Lane, John W.	I-V	See Day, 1906.
Parker, Mrs. Lotta (Meek)	IIIb	Lewiston, Me.

Evening Course, 1907

Certificate Holders

xAckroyd, Theodore C.	IIb	Chicago, Ill.
Bain, William A.	VII	Color Chemist, Bischoff & Co., New York City.
Bake, Herbert	VII	See Evening, 1905.
Ballinger, Frederick W.	IIb	Second Hand, Silesia Worsted Mills, No. Chelmsford, Mass.
xBarber, James E.	IIb	Combing Fixer, Silesia Worsted Mills, No. Chelmsford, Mass.
xBarraclough, John C.	I	Clerk, Arlington Mills, Lawrence, Mass.
Bastow, Stephen W.	IV	Second Hand, Dyehouse, Nashua Mfg. Co., Nashua, N. H.
Bayard, Pierre P.	III	Assistant Foreign Sales Manager, Oliver Chilled Plow Works, South Bend, Ind.
xBegen, Thomas W.	IIb	Overseer, Washington Mills, Lawrence, Mass.
xBenoit, William A.	Va	Loom Fixer, Everett Mills, Lawrence, Mass.
xBouille, Arthur L.	Vb	Washington Mills, Lawrence, Mass.
Brannen, Leon V.	IIa	See Day, 1907.
Brouder, John J.	VII	See Evening, 1906.
Bucklitsch, Gustave J.	IIb	Combing Machinery Setter, Washington Mills, Lawrence, Mass.
Burgess, Joseph H.	Vb	See Evening, 1906.
xButterworth, Charles A.	Va	Corduroy Cutter, Merrimack Mfg. Co., Lowell, Mass.
xButterworth, John A.	IIb	Section Hand, Washington Mills, Lawrence, Mass.
Carden, Francis E.	IIb	Lowell, Mass.
Carlson, Ernest B.	IIb	Overseer, Bigelow Carpet Co., Clinton, Mass.
Dick, Hugo P.	IIb	See Evening, 1905.
Dobbs, Willie	IIb	Second Hand, Mass. Mohair Plush Co., Lowell, Mass.
Dodge, Charles P.	IIa	Machinist, C. S. Dodge, Lowell, Mass.

Name	Course	Occupation
Duce, Benjamin	VII	See Evening, 1906.
xFlint, Leon G.	III	Percher, Washington Mills, Lawrence, Mass.
xFrechette, Alphonse J.	IIb	Student, St. Mary's College, Van Buren, Me.
xGillespie, James E.	VII	Wet Finishing, Brightwood Mfg. Company, No. Andover, Mass.
Gregson, Robert B.	I-Vc	See Evening, 1906.
Haartz, John C.	VII	President and General Manager, W. A. and J. C. Haartz, Boston, Mass.
xHaas, Ignatius	I	New York City.
Hamblett, Harry A.	I	Second Hand, Merrimack Mfg. Co., Lowell, Mass.
xHanglin, Albert J.	IV	With American Hide and Leather Co., Lowell, Mass.
xHanglin, William E.	Vb	Worcester, Mass.
xHebert, Charles L. J.	IV	With Federal Shoe Co., Lowell, Mass.
xHitchen, Harry S.	Vb	Bay State Mills, Lowell, Mass.
Hitchin, Thomas G.	Vb	Manchester, N. H.
Howard, John	VII	See Evening, 1900.
xIgnatius, Pentti	Va	Appleton Co., Lowell, Mass.
Jepson, Harry	Vb	With U. S. Bunting Co., Lowell, Mass.
Kelley, Michael H.	III	See Evening, 1902.
xKirsch, Alfred O.	Vb	Washington Mills, Lawrence, Mass.
Laffert, August W.	VII	See Evening, 1906.
Lake, William F.	III	Lowell, Mass.
xMarjerison, T. Sydney	III	Clerk, Lower Pacific Mills, Lawrence, Mass.
Martin, Willard E.	III	Salesman, W. H. Gardner & Co., Boston, Mass.
Michelmores, Harry	VII	See Evening, 1906.
Myers, James W.	VII	See Evening, 1903.
Nelson, Charles E.	IIb	Second Hand, Bigelow Carpet Co., Clinton, Mass.
xO'Brien, Michael F.	IIb	Bigelow Carpet Co., Lowell, Mass.
Porter, George K., Jr.	III	Salesman, Wellington, Sears & Co., Boston, Mass.
Read, Paul A.	VII	Supt., Barnaby Mfg. Co., Fall River, Mass.
Redman, Henry S.	I	See Evening, 1904.
Ritter, Alfred E.	IIb	With Geo. H. Hadley & Co., Lawrence, Mass.
Robbins, John	IIb	Overseer, Silesia Worsted Mills, No. Chelmsford, Mass.
Senior, George	I-Vc	See Evening, 1906.
Skinner, Clarence W.	VII	See Evening, 1905.
Smith, Arthur	Vc	See Evening, 1905.
Smith, Ernest B.	Vb	Warp Dresser, Multnomah Mohair Mills, Portland, Oreg.
xSmith, James	Vb	Loom Fixer, Wood Worsted Mills, Lawrence, Mass.
xSmith, Percy H.	Vb	Washington Mills, Lawrence, Mass.
Smith, William E.	VII	See Evening, 1905.
Varnum, Arthur C.	Vb	See Day, 1906.
xWahlberg, Einar S.	I	Fitchburg, Mass.

Name	Course	Occupation
xWaterworth, Frank W.	Vb	Second Hand, Washington Mills, Lawrence, Mass.
Webb, Francis H.	III	See Evening, 1904.
Webber, John F.	III	Style Man, Converting Dept., Marshall Field & Co., Chicago, Ill.
xWhittaker, Thomas B.	Ib	Clerk, Arlington Mills, Lawrence, Mass.
Wiggin, Leon M.	III	Designer, U. S. Bunting Co., Lowell, Mass.
xWolf, William C.	Va	Loom Fixer, Pacific Mills, Lawrence, Mass.
xWolger, John J.	III	Loom Fixer, Methuen Co., Methuen, Mass.
xYare, John F.	Vb	Middlesex Co., Lowell, Mass.

Day Course, 1908

Diploma Graduates

Abbott, George R.	II	Andover, Mass.
Ballard, Horace W. C. S.	IV	Overseer of Finishing and Dyeing, Dexter, Richards and Sons Co., Newport, N. H.
Dwight, John F., Jr.	II	Pawtucket, R. I.
Farr, Leonard S.	II	Overseer, Farr Alpaca Co., Holyoke, Mass.
Gay, Olin D.	II	Asst. Supt., Gay Bros. Co., Cavendish, Vt.
Hadley, Walter E.	IV	Instructor in Chemistry, Lowell Textile School, Lowell, Mass.
Huising, Geronimo H.	I	Assistant Textile Appraiser, Bureau of Customs, Manila, P. I.
Jenckes, Leland A.	VI	Asst. Master Mechanic, Dwight Mfg. Co., Chicopee, Mass.
Lewis, LeRoy C.	IV	Foreman, Boiler, Champlain Silk Mills, Whitehall, N. Y.
Mailey, Howard T.	II	Second Hand, French Drawing, Wood Worsted Mills, Lawrence, Mass.
Perkins, Joshua D.	III	With Amoskeag Mfg. Co., Manchester, N. H.
Prince, Sylvanus C.	VI	Lowell, Mass.
xProctor, Braman	IV	Salesman, Badische Co., Boston, Mass.
Reynolds, Fred B.	II	Clerk, M. T. Stevens and Sons Co., No. Andover, Mass.
Robinson, Ernest W.	IV	Overseer, Belding Bros. & Co., Rockville, Conn.
Weinz, W. Elliot	IV	Representative of Badische Co., Atlanta, Ga.
Wingate, William H.	IV	Chemist, Sidney Blumenthal and Co., Shelton, Conn.

Evening Course, 1908

Certificate Holders

Arnold, Warren H.	VII	Second Hand, U. S. Bunting Co., Lowell, Mass.
xBarrington, James L.	IV	Color Chemist, Kalle and Co., New York City.
Begen, Thomas W.	Iib	See Evening, 1907.

Name	Course	Occupation
xBerry, Alfred H.	VI	Electrical Engineer, Silesia Worsted Mills, No. Chelmsford, Mass.
xBroadbent, James H.	Vb	With U. S. Bunting Co., Lowell, Mass.
xBroadbent, William	Vb	Weaver, U. S. Bunting Co., Lowell, Mass.
xBrown, James T.	III	Section Hand, Silesia Worsted Mills, No. Chelmsford, Mass.
Buckley, Harry	IV	Overseer, Warp Dyeing, Arlington Mills, Lawrence, Mass.
Campbell, Archibald	IV	Asst. to Chemist, J. C. Ayer Co., Lowell, Mass.
Carden, Francis E.	IIb	See Evening, 1907.
Carney, William J.	I	Section Hand, Arlington Mills, Lawrence, Mass.
xCarter, Charles R.	Vb	Weaver, Washington Mills, Lawrence, Mass.
xCorr, Eben W.	Vb	With Prudential Life Ins. Co., Lawrence, Mass.
xCorr, James F.	Vb	Loomfixer, Bay State Mills, Lowell, Mass.
Craven, Harry	VII	Clerk, Arlington Mills, Lawrence, Mass.
Dick, Hugo P.	Vb	See Evening, 1905.
xDixon, Arthur	III	With Elston Worsted Co., Methuen, Mass.
Dobbs, Willie	IIb	See Evening, 1907.
Dunn, George C.	III	Second Hand, Dyehouse, Tremont and Suffolk Mills, Lowell, Mass.
Flynn, William J.	Vb	Lowell, Mass.
Greenhalge, James	Vc	Lowell, Mass.
xHallbauer, William R.	Vb	At Washington Mills, Lawrence, Mass.
Hanson, Edward	III	Overseer, Merrimack Mfg. Co., Lowell, Mass.
xHardman, David B.	IV	Machine Printer, Pacific Mills, Lawrence, Mass.
xHarris, Louis	VII	Asst. to Clothing Designer, J. Peavy and Bros., Boston, Mass.
xHennessey, Ambrose M.	VII	At Talbot Mills, No. Billerica, Mass.
Hill, Harold	I	Section Hand, Arlington Mills, Lawrence, Mass.
xHoellrich, Martin J.	Vb	With Wood Worsted Mills, Lawrence, Mass.
xIngham, Benjamin W.	I	Section Hand, Boott Mills, Lowell, Mass.
xLagerbald, Jarl	VII	Asst. Chemist, Wood Worsted Mills, Lawrence, Mass.
Lake, William F.	P. G. III	See Evening, 1907.
Maker, Isaac A.	I*	Draftsman, Lowell Machine Shop, Lowell, Mass.
Marjerison, T. Sydney	P. G. III	See Evening, 1907.
xMarshall, Fred K. R.	VI	Electrician, Arlington Mills, Lawrence, Mass.
xMcGill, William E.	VII	Second Hand, Worcester Woolen Co., Worcester, Mass.
xMcGovern, James	VII	Cloth Inspector, Arlington Mills, Lawrence, Mass.
McKenna, Jerimiah J.	Vb	With Merrimack Woolen Co., Dracut, Mass.
Mortenson, Carl W.	IIa	See Evening, 1903.
Nutter, James R.	VI	With Merrimack Mfg. Co., Lowell, Mass.

Name	Course	Occupation
*Osbeck, William J.	III	
xPatterson, Alfred H.	III	Clerk, Lower Pacific Mills, Lawrence, Mass.
xPerkins, Thomas, Jr.	I	Asst. Supt., Tremont and Suffolk Mills, Lowell, Mass.
Picken, William	III	Purchasing Agent, Silesia Worsted Mills, No. Chelmsford, Mass.
Plumer, Paul T.	Vb	Pattern Weaver, U. S. Bunting Co., Lowell, Mass.
Porter, George K., Jr.	P. G. III	See Evening, 1907.
Preble, George A.	III	Second Hand, Mass. Cotton Mills, Lowell, Mass.
xSaalfrank, Joseph C.	III	Design Dept., Arlington Mills, Lawrence, Mass.
Scally, Edward	VI	With Wm. Scally, Lowell, Mass.
Schermerhorn, George E.	Va	See Evening, 1902.
xSchuster, William F.	VII	Second Hand, Washington Mills, Lawrence, Mass.
Seddon, N. Graham	III	Overseer, Everett Mills, Lawrence, Mass.
Semple, Alexander	III	Clerk, Hamilton Mfg. Company, Lowell, Mass.
Shackleton, J. Henry	IV	Overseer, Dyeing, Pemberton Mills, Lawrence, Mass.
xSimoneau, Verner W.	VI	Machinist, Upton and Gilman, Lowell, Mass.
Spurr, Albert R.	VII	Assistant Finisher, Pacific Mills, Lawrence, Mass.
Spurr, James H., Jr.	IV	Asst. Bacteriologist and Chemist, State Board of Health Experimental Station, Lawrence, Mass.
xStewart, Charles	Va	Weaver, Tremont and Suffolk Mills, Lowell, Mass.
Teichmann, Alfred A.	Vb	With Washington Mills, Lawrence, Mass.
Tucker, John T.	I	Clerk, Kitson Machine Shop, Lowell, Mass.
Varnum, Arthur C.	P. G. III	See Day, 1906.
Webber, John F.	P. G. III	See Evening, 1907.
Whittaker, Thomas	IIb	See Evening, 1907.
Wiggin, Leon M.	P. G. III	See Evening, 1907.
Willgeroth, Henry J.	III	Asst. Designer, Wood Worsted Mills, Lawrence, Mass.
Wilmot, Joseph	III	Instructor, Weaving Dept., Lowell Textile School, Lowell, Mass.
Wolf, William C.	Vb	See Evening, 1907.
Wood, Jonathan	Va	See Evening, 1902.
xYoung, Richard, Jr.	Va	Loomfixer, Mass. Cotton Mills, Lowell, Mass.

Day Course, 1909

Diploma Graduates

Brainerd, Arthur T.	IV	Salesman, H. A. Metz, New York City.
Conant, Harold W.	I	Pattern Weaver, Conant, Houghton & Co., Littleton, Mass.
Fairbanks, Almonte H.	II	Chicago, Ill.

Name	Course	Occupation
Ferguson, William G.	III	With American Telephone and Telegraph Co., Boston, Mass.
Fiske, Starr H.	II	Instructor, Weaving Dept., Lowell Textile School, Lowell, Mass.
Gyzander, Arne K.	IV	Bleacher, Union Wadding Co., Pawtucket, R. I.
Holden, Francis C.	IV	With Bigelow Carpet Co., Clinton, Mass.
xKay, Harry P.	II	With Arlington Mills, Lawrence, Mass.
Laughlin, James K.	III	With Winslow Bros. & Smith Co., Norwood, Mass.
Levi, Alfred S.	IV	Asst. Mgr., Liondale Bleach, Dye and Print works, Rockaway, N. J.
Mason, Archibald L.	VI	Foreman, Champlain Silk Mills, Brooklyn, N. Y.
Mullen, Arthur T.	II	Boston, Mass.
Newall, J. Douglas	IV	With Minetto Shade Cloth Co., Minetto, N. Y.
Parkis, William L.	I	Asst. Foreman, Weaving, Boston Woven Hose and Rubber Co., Cambridgeport, Mass.
Pease, Chester C.	I	Tester, Holmes Mfg. Co., New Bedford, Mass.
Potter, Carl H.	I	With Sayles Bleachery, Saylesville, R. I.
Prescott, Walker F.	IV	Assistant Manager, American Felt Co., Rockville, Mass.
Saunders, Harold F.	IV	Chemist, Pacific Mills, Lawrence, Mass.
Stone, Ira A.	IV	With Joseph M. Wade Pub. Co., Boston, Mass.
Wood, J. Carleton	IV	Second Hand, Dye House, New York Mills Bleachery, New York Mills, N. Y.

Evening Course, 1909

Certificate Holders

xAnderson, Carl A.	IV	Machinist, General Electric Co., Lynn, Mass.
Arnold, Warren H.	III	See Evening, 1908.
xBailey, Rothwell	Va	With Mass. Cotton Mills, Lowell, Mass.
Bake, Herbert	P. G. III	See Evening, 1905.
Banks, Jonas	Va	Loomfixer, Mass. Cotton Mills, Lowell, Mass.
Benoit, Benjamin L.	VIb	Clerk, Lowell Weaving Co., Lowell, Mass.
xBooth, Arthur	III	Clerk, Arlington Mills, Lawrence, Mass.
Bowen, Herbert E.	III	With Shaw Stocking Co., Lowell, Mass.
Buckley, Richard A.	Vb	With U. S. Bunting Co., Lowell, Mass.
Bunce, Raymond H.	Vb	With Bay State Mills, Lowell, Mass.
Butler, Elizabeth M.	VIId	Teacher, City of Lowell, Lowell, Mass.
xCarman, William	Va	With Mass. Cotton Mills, Lowell, Mass.
xChesworth, Frank K.	Va	With Everett Mills, Lawrence, Mass.
Cockell, Frederick H.	III	Loomfixer, Washington Mills, Lawrence, Mass.
Cowdrey, Charles E.	Vb	See Evening, 1902.
Davison, Frank L.	Vb	With Talbot Mills, No. Billerica, Mass.
Dulligan, Charles E.	VIa	Tool Maker, U. S. Cartridge Co., Lowell, Mass.

Name	Course	Occupation
Dunning, Carlos W.	VIb	With Appleton Co., Lowell, Mass.
Gaunt, Ernest H.	III	Superintendent, Tremont Worsted Mills, Methuen, Mass.
Gilinson, Philip J.	VIa	Experimental Work, Heinze Electric Co., Lowell, Mass.
xGordon, Herbert E.	III	Clerk, Arlington Mills, Lawrence, Mass.
Hanson, Edward	P. G. III	See Evening, 1908.
xHayes, Michael C.	IIa	With Talbot Mills, No. Billerica, Mass.
Hill, Harold	Va	See Evening, 1908.
Hillier, Arthur P.	IIb	Overseer, Silesia Worsted Mills, No. Chelmsford, Mass.
Hodgkins, Albert A.	VII	Assistant Designer, American Mills Co., Waterbury, Conn.
xHolt, Harry C.	VIa	Electrician, Mass. Cotton Mills, Lowell, Mass.
xHouston, William I.	III	Weaver, Washington Mills, Lawrence, Mass.
xHowell, Edward A.	Va	Loomfixer, Pemberton Mills, Lawrence, Mass.
xJoyce, John	Vc	Weaver, Merrimack Mfg. Company, Lowell, Mass.
Kaler, Harold F.	VIb	Tester, Heinze Electric Co., Lowell, Mass.
Kelley, Bernard J., Jr.	VIc	With P. J. O'Hearn, Lowell, Mass.
Kershaw, Benn	Va	Second Hand, Tremont & Suffolk Mfg. Co., Lowell, Mass.
xLincourt, Henry E.	VIb	With Federal Shoe Co., Lowell, Mass.
Madden, Peter	Va	Loomfixer, Mass. Cotton Mills, Lowell, Mass.
xMahoney, Dennis J.	Vb	With Talbot Mills, No. Billerica, Mass.
McClure, Charles G.	VIb	With Heinze Electric Co., Lowell, Mass.
McLay, John	IIb	See Evening, 1906.
Molloy, Andrew	P. G. III	See Evening, 1902.
Musard, Albert E., Jr.	Vc	With Orinoko Mills, Philadelphia, Pa.
Nelson, Ernest H.	I	See Evening, 1900.
Orrell, Frank L.	VIb	Section Hand, Mass. Mohair Plush Co., Lowell, Mass.
Palmer, G. Buel	Vb	See Evening, 1903.
Paquin, Joseph	VIa	Detroit, Mich.
Parsons, Joseph G.	III	Pattern Weaver, Thos. Kitson & Son, Stroudsburg, Pa.
xPearson, Fred	VIa	Machinist, Lowell Machine Shop, Lowell, Mass.
Read, Paul A.	Va	See Evening, 1907.
Robinson, Thomas	I	Mule Spinner, Boott Cotton Mills, Lowell, Mass.
Ryan, Edward P.	I	Overseer, Tremont and Suffolk Mills, Lowell, Mass.
Schubert, George J.	III	See Evening, 1906.
Schuerfeld, Harry W.	IIi	Salesman, C. U. Thomas and Co., Boston, Mass.
Smith, Arthur	P. G. III	See Evening, 1905.
Smith, George A.	VII	See Evening, 1905.
Smith, William E.	P. G. III	See Evening, 1905.
Stocks, Carl W.	VI	With Everett Mills, Lawrence, Mass.
Stopherd, William H.	P. G. III	See Evening, 1899.
*Sullivan, Humphrey F.	I	

Name	Course	Occupation
Sykes, Alvin E.	VIa	Shipping Clerk, Lowell Machine Shop, Lowell, Mass.
Tucker, John T.	Va	See Evening, 1908.
Varnum, Arthur C.	VII	See Day, 1906.
Vogt, Alfred H.	IIb	See Evening, 1902.
Walsh, Michael L.	I	Section Hand, Appleton Co., Lowell, Mass.
Ware, Edward W.	III	With Wellington, Sears & Co., Boston, Mass.
Watson, Luther F.	IIb	Clerk, Arlington Mills, Lawrence, Mass.
xWeigel, Frederick A.	VIIb	Machinist, Stanley Mfg. Co., Lawrence, Mass.
Young, Richard, Jr.	Vc	See Evening, 1908.

Day Course, 1910

Diploma Graduates

Arienti, Peter J.	IV	Chemist, Wanskuck Co., Providence, R. I.
Cary, Julian C.	VI	Draftsman, Merrimack Mfg. Co., Lowell, Mass.
Clark, Thomas T.	II	With Talbot Mills, No. Billerica, Mass.
Duval, Joseph E.	II	Assistant to Superintendent, Mass. Mohair Plush Co., Lowell, Mass.
Finlay, Harry F.	IV	Color Chemist, American Dyewood Co., Boston, Mass.
Fletcher, Roland H.	VI	Draftsman, B. F. Sturtevant Co., Hyde Park, Mass.
Gale, Harry L.	III	Assistant Designer, Faulkner, Page and Co., Lynn, Mass.
Goldberg, George	VI	Electrical Tester, General Electric Co., Lynn, Mass.
Hardy, Philip L.	VI	With L. E. Locke, South Lawrence, Mass.
Howe, Woodbury K.	I	Cost Finding, Anchor Webbing Co., Woonsocket, R. I.
Hurtado, Leopoldo, Jr.	VI	General Manager, Hurtado and Co., Uruapan, Mich., Mexico.
Jelleme, William O.	I	Investigator, Brighton Mills, Passaic, N. J.
Keough, Wesley L.	II	Assistant Dyer, Mass. Mohair Plush Co., Lowell, Mass.
Lamb, Arthur F.	II	With American Felt Co., Rockville, Mass.
Manning, Frederick D.	IV	Second Hand, Dychouse, Appleton Co., Lowell, Mass.
McCool, Frank L.	IV	Instructor, Dyeing Dept., Lowell Textile School, Lowell, Mass.
Murray, James A.	II	With Talbot Clothing Co., Boston, Mass.
Nichols, Raymond E.	VI	Draftsman, Lowell Bleachery, Lowell, Mass.
Putnam, Leverett N.	IV	With Goodall Worsted Co., Sanford, Me.
Reed, Norman B.	I	Investigator, Smith and Dove Mfg. Co., Andover, Mass.
Robson, Frederick W. C.	IV	Color Chemist, United Indigo and Chemical Co., Boston, Mass.
Smith, Doane W.	II	Springfield, Mass.
Smith, Theophilus G., Jr.	IV	Chemist, Badische Co., New York City.
Stronach, Irving N.	IV	With Boston Mfg. Co., Waltham, Mass.
Whitcomb, Roscoe M.	IV	With Merchants Publishing Co., Kalamazoo, Mich.

Evening Course, 1910

Certificate Holders		
Name	Course	Occupation
Anderton, Harry	Va	Loomfixer, Mass. Cotton Mills, Lowell, Mass.
Atkinson, Norman	Vb	With Bay State Mills, Lowell, Mass.
Bailey, Carl E.	I	Knoxville, Tenn.
Banks, Jonas	Vc	See Evening, 1909.
Berry, Percy W.	Vb	With Wood Worsted Mills, Lawrence, Mass.
xBouchard, Ethan J.	Vc	Loomfixer, Merrimack Mfg. Co., Lowell, Mass.
xBourchard, Robert R.	Vb	With Merrimack Mfg. Co., Lowell, Mass.
Burgess, Joseph H.	III	See Evening, 1906.
Campbell, Edward G.	VIc	Lowell, Mass.
Christison, Hugh	IV	With Arlington Mills, Lawrence, Mass.
Cox, Edward J.	III	Bookkeeper, Merrimack Mfg. Co., Lowell, Mass.
Cutress, Albert J.	VIc	Machinist, Lowell Machine Shop, Lowell, Mass.
Deely, John A.	Vb	Pittsfield, Mass.
Duckett, Fred I.	Vb	Section Hand, Washington Mills, Lawrence, Mass.
Dulligan, Lawrence F.	VIa	Machinist, Auto Fire Vulcanizing Co., Lowell, Mass.
Dunn, George C.	IVa	See Evening, 1908.
Eklund, Louis V.	Vb	With Merrimack Woolen Co., Dracut, Mass.
Fielding, Fred	Vc	With Merrimack Woolen Co., Dracut, Mass.
Flemings, Lester A.	Va	Clerk, Lowell Weaving Co., Lowell, Mass.
Flynn, John	VIc	Toolmaker, Kitson Machine Shop, Lowell, Mass.
xFlynn, Patrick	Vb	With Bay State Mills, Lowell, Mass.
Fujiyoshi, Heisayu	I	South Lowell, Mass.
Gaspar, Edith E.	VIc	With Lawrence Hosiery, Lowell, Mass.
Gauthier, William	Vb	With Bay State Mills, Lowell, Mass.
Gookin, Alice L.	VIc	College of St. Elizabeth, Convent, N. J.
Hering, Paul C.	III	Loomfixer, Wood Worsted Mills, Lowell, Mass.
Hibbert, George E.	Va	Loomfixer, Hamilton Mfg. Co., Lowell, Mass.
Hill, Ellsworth O. C.	I Ib	With Wood Worsted Mills, Lawrence, Mass.
Hilliard, William B.	VIa	Machinist, Lamson C. S. S. Co., Lowell, Mass.
Hird, Arthur W.	I	Overseer, Lawrence Mfg. Co., Lowell, Mass.
Hird, James A.	IVa	Clerk, Boston and Maine Railroad Co., Lowell, Mass.
Hodgkins, Albert A.	III	See Evening, 1909.
Hoellrich, Martin J.	Vc	See Evening, 1908.
Holt, Gavin O.	IVa	Designer, Boott Mills, Lowell, Mass.
Houston, William I.	Vb	See Evening, 1909.
Hunton, John H.	VII	Student, Lowell Textile School, Lowell, Mass.
Hurtado, Leopoldo, Jr.	Vc	See Day, 1910.

Name	Course	Occupation
Hutton, Thomas V.	Vb	Loomfixer, New England Bunting Co., Lowell, Mass.
Jackson, Frank	VIb	Draftsman, United Shoe Machinery Co., Lawrence, Mass.
Jean, Adhemard C.	VIa	Inspector, Line Dept., B. and N. St. Railway Co., Lowell, Mass.
Jordan, Frederic W.	IV	Draftsman, Smith and Brooks, Lowell, Mass.
Jorde, Linville T.	VIc	With Lawrence Mfg. Co., Lowell, Mass.
Kershaw, Benn	Vc	See Evening, 1909.
Kershaw, Samuel S.	IIb	Section Hand, Silesia Worsted Mills, No. Chelmsford, Mass.
Krause, George	VII	Second Hand, Arlington Mills, Lawrence, Mass.
LaJeunesse, Joseph A.	IVa	Tester, U. S. Cartridge Co., Lowell, Mass.
Leck, Arthur J.	VII	With Pacific Mills, Lawrence, Mass.
Ledoux, Blanche H.	VIId	With A. G. Pollard Co., Lowell, Mass.
Lemire, Arthur	I	Second Hand, Hamilton Mfg. Co., Lowell, Mass.
Mabbett, Albert L.	III	Designer, Newport Woolen Co., Newport, Me.
Maxcy, Leo M.	VIc	Foreman, F. E. Jewett and Co., Lowell, Mass.
McAuliffe, Patrick D.	VIb	With C. B. Coburn Co., Lowell, Mass.
McElroy, Samuel H.	Vb	Assembler, Heinze Electric Co., Lowell, Mass.
Messiah, Hiram G.	Vb	With G. A. Rogers Bakery, Reading, Mass.
Nelson, Ernest H.	Vc	See Evening, 1900.
Nelson, Gustave A.	Vb	With T. Martin and Bro., Lowell, Mass.
Nichols, Clarence W.	Vb	With Geo. E. Kunhardt, Lawrence, Mass.
Nicoll, John	IVa	Overseer, Smith and Dove Mfg. Co., Andover, Mass.
Paquin, Joseph	VIb	See Evening, 1909.
Pettersen, Birger	VIa	Draftsman, Lowell Bleachery, Lowell, Mass.
Phelps, Mary I.	VIId	Teacher, City of Lowell, Lowell, Mass.
Redman, Henry S.	IV	See Evening, 1904.
Robinson, Thomas	Vc	See Evening, 1909.
Root, Francis X., Jr.	III	Loomfixer, Boott Mills, Lowell, Mass.
Shackleton, John H.	I	See Evening, 1908.
Stewart, William W.	IV	Second Hand, Dychouse, Mass. Cotton Mills, Lowell, Mass.
Stopherd, William H.	VII	See Evening, 1899.
Stott, Bertram S.	Vb	With Geo. E. Kunhardt, Lawrence, Mass.
Stott, Samuel	IV	Second Hand, Arlington Mills, Lawrence, Mass.
Sullivan, Michael F.	VIb	With Merrimack Woolen Co., Dracut, Mass.
Todd, Henry	VII	With Farwell Bleachery, Lawrence, Mass.
Welch, Benjamin L.	VIb	Electrician, Wood Worsted Mills, Lawrence, Mass.
Whitman, William P.	IVa	With Merrimack Mfg. Co., Lowell, Mass.
Whitney, Frederick A.	IV	Williamstown, Mass.
Williams, Allen R.	I	With Hamilton Mfg. Co., Lowell, Mass.
Worthington, John A.	I	Second Hand, Merrimack Mfg. Co., Lowell, Mass.

CONTENTS

Administration	11-152
Advanced Standing	81
Alumni Association	155
Application Blanks	81-219-220
Athletics	71
Attendance	89
Attendance Card	81
Awards of Merit	87-89-94
Buildings	21
Bulletins and Catalogue	94
Calendar	4-5
Certificate of Evening Courses	31
Conduct	91
Corporation	7
COURSES OF INSTRUCTION :	
Day Classes	25-95
Evening Classes	27
Diploma	89
Entrance Qualifications for Day Students	73-108
Equipment	33
Examinations	83
Fees	83
General Committees	9
General Information	93
Graduate Course	85
Graduates, Day Class, 1910	156
Graduates, Evening Classes, 1910	158
Graduates, Alphabetical Register	177
Graduates, Class Register	192
Introduction	15
Instructors	11-152
Library	93
Materials	94
Object of the School	15
Post Graduate Courses	106
Records and Reports of Standing	85
Register of Day Students	160
Register of Evening Students	165
Sessions	93
Southwick Textile Club	155
SUBJECTS OF INSTRUCTION :	
Textile Engineering	108
Chemistry and Dyeing	118
Textile Design and Power Weaving	129
Languages and History	134
Cotton Yarns	136
Woolen and Worsted Yarns	142
Finishing	148
Physical Culture	151
Thesis	85
Trustees	7
Women's Department	31

FILL OUT AND SEND TO PRINCIPAL

(DAY)

Lowell Textile School

LOWELL, MASS.

APPLICATION BLANK

Date

I, hereby
apply for admission to the Lowell Textile School as DAY
student.

Name in Full,

Date and Place of Birth,

Home Address, { City or Town State
..... Street and Number

Parent or Guardian,

Residence of Parent or Guardian,

School last attended,

(INDICATE COURSE)

- | | |
|--------------------------|---------------------------|
| I. Cotton Manufacturing. | II. Wool Manufacturing. |
| III. Textile Design. | IV. Chemistry and Dyeing. |
| VI. Textile Engineering. | |

Signature,

ENDORSEMENT BY OFFICER OF SCHOOL LAST ATTENDED

I hereby certify that
the above applicant has completed the regular four year
course at the..... High School, and has satisfac-
torily passed the subjects required under "Entrance Qualifica-
tions," pages 73-81 of Catalogue of 1911-1912. He has passed
satisfactorily.....years course in French or German.

Signed :

Principal School, located

at State of

Date.....

FORM FOR EVENING CLASSES ON OTHER SIDE

(EVENING)

FILL OUT AND SEND TO PRINCIPAL

Lowell Textile School

LOWELL, MASS.

APPLICATION BLANK

DATE.....

I, hereby
apply for admission to the Lowell Textile School as EVENING
student.

Name in Full,

Date and Place of Birth,

Home Address, {
City or Town State
.....
Street and Number

Parent or Guardian,

Residence of Parent or Guardian,

School last attended,

(INDICATE COURSE)

- | | |
|-------------------------------------|------------------------------------|
| I. Cotton Spinning. | V. Weaving. |
| II. a—Woolen Spinning. | a—Cotton Weaving. |
| b—Worsted Spinning. | b—Woolen and Worsted Weaving. |
| | c—Dobby and Jacquard Weaving. |
| III. a—Textile Design. | VI. Engineering. |
| b—Freehand Drawing. | a—Elements of Engineering. |
| IV. Chemistry and Dyeing. | b—Mechanical Drawing. |
| a—Elementary Chemistry. | c—Machine Shop. |
| b—Textile Chemistry and Dyeing. | VII. Woolen and Worsted Finishing. |
| c—Analytical Chemistry. | |
| d—Textile and Analytical Chemistry. | |

Signature,

ENDORSEMENT BY SOME OFFICER OF SCHOOL LAST ATTENDED:

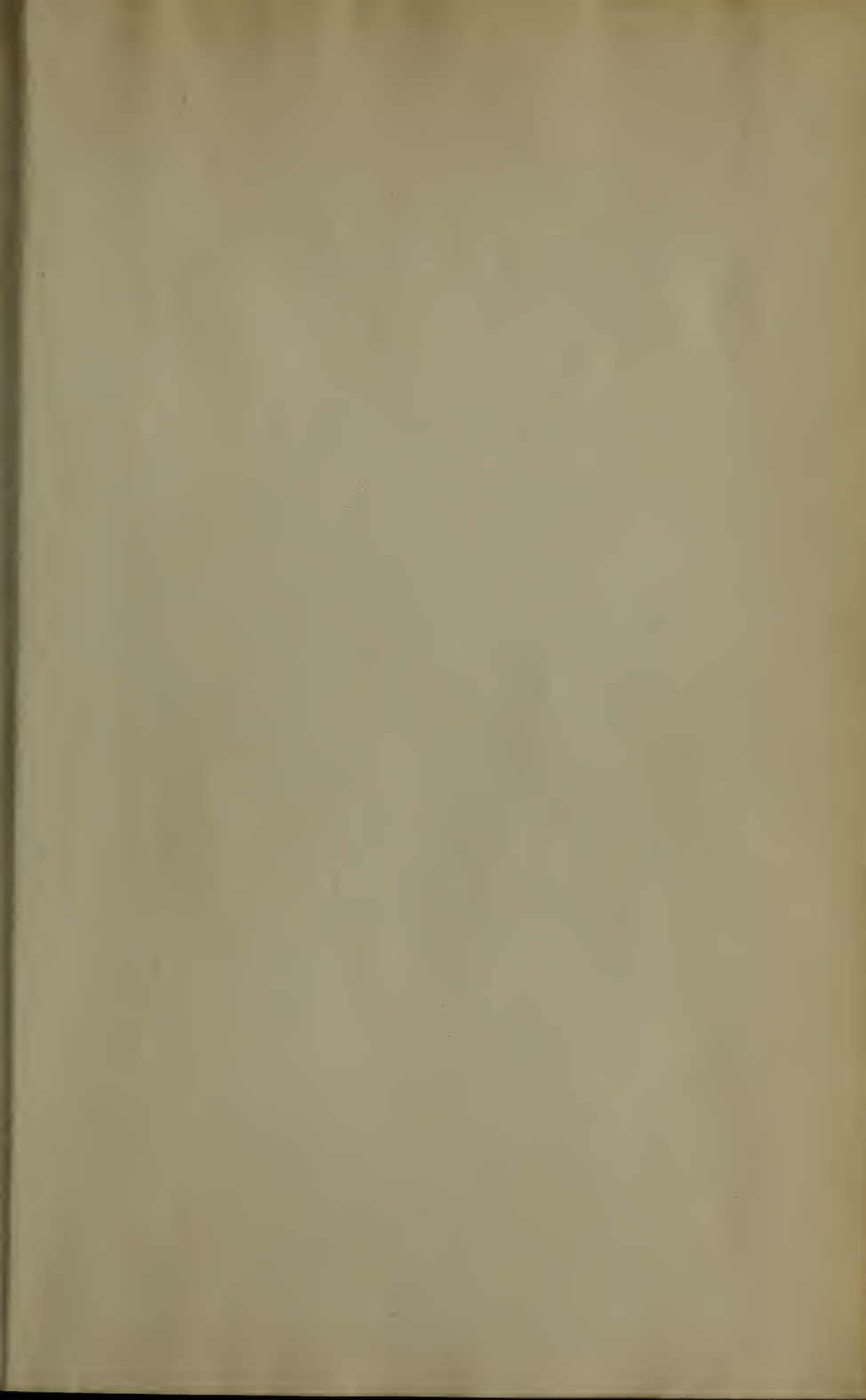
I hereby certify that
the above applicant is duly qualified to pursue with profit the
work of the Lowell Textile School.

SIGNED :

Principal School, located

at State of

Date



WELLS BINDERY
WALTHAM, MASS.
DEC. 1949

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L95

Bulletin of the
Lowell Textile
Institute

1909-1911

